

EVALUATION OF THE QUALITY OF MS RESEARCH STUDIES UNDER AGRICULTURAL EXTENSION DISCIPLINE IN BANGLADESH

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**EVALUATION OF THE QUALITY OF MS RESEARCH
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DISCIPLINE IN BANGLADESH**

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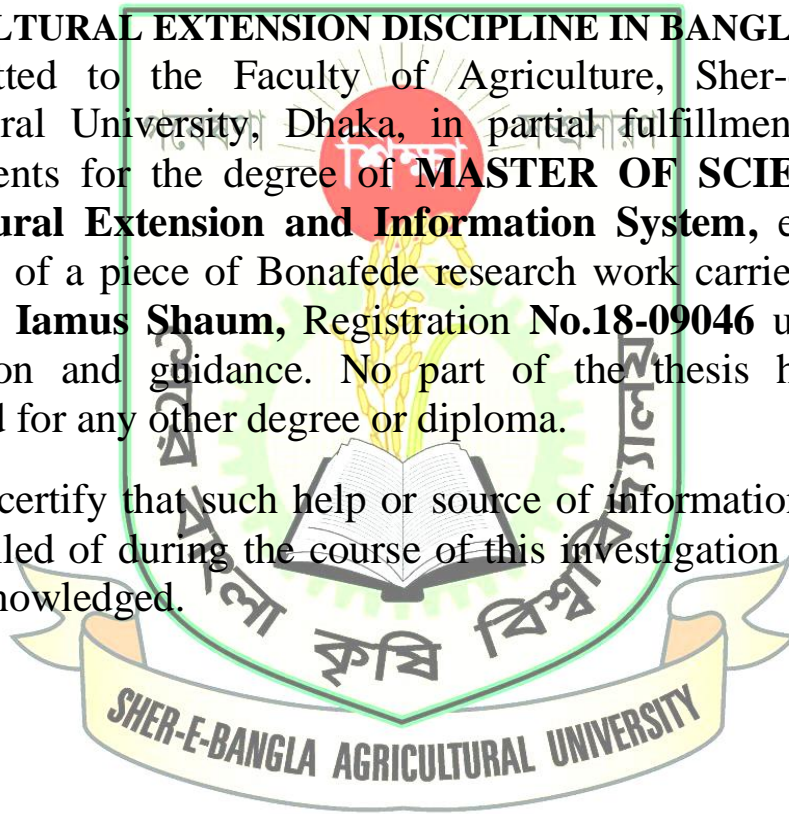
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CERTIFICATE

This is to certify that thesis entitled, “**EVALUATION OF THE QUALITY OF MS RESEARCH STUDIES UNDER AGRICULTURAL EXTENSION DISCIPLINE IN BANGLADESH**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in Agricultural Extension and Information System**, embodies the result of a piece of Bonafede research work carried out by **A. K. M Iamus Shaum**, Registration No.18-09046 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that such help or source of information, as has been availed of during the course of this investigation has duly been acknowledged.



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**DEDICATED TO
MY
BELOVED PARENTS**

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ABSTRACT

A study was performed by reviewing the MS research studies under agricultural extension discipline of Bangladesh. Samples were selected randomly from online digital archive of thesis and journals of Sher-e-Bangla Agricultural University, Dhaka within 850 MS studies 90 were selected and have been coded, treated, tabulated and statistically analyzed according to the objectives of the study. Despite their more varied nature, MS research findings can be evaluated for accuracy through a variety of means. MMAT (Mixed Method Appraisal Tool) approach was considered for the assessment developed by Hong *et al.*, 2018. Measurement of the validity of the finding(s) of the following research studies answer of 5 closed form question was selected. To determination of the aim of the qualitative research studies two (2) key questions was selected. All the selected studies under these questions' response positively. Accuracy in methodology in selected researches was considered in the following study and for assessment five (5) key questions were selected. Determination of research paradigm of selected MS research studies one (1) key question was selected and all the interpretation was positive. To determination of data collection quality of the MS research studies seven (7) key questions was selected. To determination of the researchers' bias of the selected MS research studies two (2) key questions was selected. To Determination of ethical standard qualitative research studies four (4) key questions was selected. Determination of rigor of the selected MS research studies six (6) key questions was selected. Determination of reliability of the selected MS research studies five (5) key questions was selected. Determination of credibility & trustworthiness of the selected MS research studies three (3) key questions was selected. Selected tool was applied on the sample research studies to find out the goodness of fit of the tool and found capable of measure the basic requirements of the selected MS research works. There are widespread debate continues around the feasibility and utility of the assessment and availability and applicability of any well-constructed evaluation tool. In assessing the quality of MS research studies, it was focus on quality of reporting, methodological rigor and conceptual depth and bread of qualitative research studies and applicability of its findings based on the available literature of the selected MS research studies.

CONTENTS

CHAPTER.	PAGE NO.
ACKNOWLEDGEMENT	I
ABSTRACT	II
LIST OF CONTENTS	III
LIST OF TABLES	VI
LIST OF APPENDICES	VII
1 INTRODUCTION	1
2 REVIEW OF LITERATURE	5
2.1 Developing the Content of The Evaluation	5
2.2 Core Criteria for Quality Evaluation	6
2.3 Validity of the Finding(S)	6
2.4 Literatures on Quality of Research Methodology	7
2.5 Evaluation of Aim of the Research	8
2.6 Literatures on Research Paradigm	9
2.7 Literatures on Data Collection	10
2.8 Literatures on Researchers' Bias	10
2.9 Literatures on Ethical Standard	11
2.10 Literatures on Rigor	12
2.11 Literatures on Reliability	13
2.12 Literatures on Credibility & Trustworthiness	14
2.13 Stages in The Evaluation of Qualitative Research	14
3 MATERIALS AND METHODS	16
3.1 Methodological Approach and Research Design Of The Study	16
3.2 Locale of the Study	16
3.3 Sampling Design	17
3.4 Selection of the Variables	18
3.5 Instrumentation	19
3.6 Methods and Procedure of Data Collection	19
3.7 Processing of the Data	19
3.8 Measurement of the Variables	20
3.9 Data Analysis Strategy	22
4 RESULTS AND DISCUSSION	23
4.1 Explanation & Exploring the evaluation tools and its implication on the quality of MS research studies	23-71
5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	72
REFERENCES	76
APPENDICES	81

LIST OF TABLES

TABLE	TITLE	PAGE NO.
3.1	Population and sample of MS thesis papers of agricultural extension discipline	18
4.1.1.1	Frequency table of measurement of the validity of the finding(s)	27
4.1.1.2	Interpretation of Q1: Were the outcome measures valid?	28
4.1.1.3	Interpretation of Q2: Were the outcome measures reliable?	28
4.1.1.4	Interpretation of Q3: Were outcome criteria are used in the study valid?	29
4.1.1.5	Interpretation of Q4: Is there sufficient breadth (e.g. contrast of two or more perspective) and depth (e.g. insight into a single perspective)?	30
4.1.1.6	Interpretation of Q5: Are the findings clearly presented?	31
4.1.2.1	Frequency of determination of the aim of the research	32
4.1.2.2	Interpretation of Q1: Are the findings relevant to the aims of the study?	33
4.1.2.3	Interpretation of Q2: Was the purpose stated clearly?	33
4.1.3.1	Frequency table of Accuracy in methodology	35
4.1.3.2	Interpretation of Q1: Is the sampling strategy relevant to address the research question?	36
4.1.3.3	Interpretation of Q2: Is the sample representative of the target population?	36
4.1.3.4	Interpretation of Q3: Are the measurements appropriate?	37
4.1.3.5	Interpretation of Q4: Is the risk of nonresponse bias low?	37
4.1.3.6	Interpretation of Q5: Is the statistical analysis appropriate to answer the research question?	38
4.1.4.1	Frequency table for determination of research paradigm	39
4.1.4.2	Interpretation of Q1: Was relevant background literature reviewed?	40
4.1.5.1	Frequency table for determination of data collection & analysis	43

4.1.5.2	Interpretation of Q1: Are the data collection methods clearly described?	45
4.1.5.3	Interpretation of Q2: Were the appropriate data collected to address in the research?	45
4.1.5.4	Interpretation of Q3: Has the diversity of perspective and content been explored?	46
4.1.5.5	Interpretation of Q4: Has the detail and depth been demonstrated?	46
4.1.5.6	Interpretation of Q5: Are responses compared and contrasted across groups?	47
4.1.5.7	Interpretation of Q6: Was population size justified?	47
4.1.5.8	Interpretation of Q7: Was sample size justified?	48
4.1.5.9	Interpretation of Q8: Do the collected data allow to address the research questions?	48
4.1.6.1	Frequency table for determination of the researchers' bias	49
4.1.6.2	Interpretation of Q1: Are the researcher's own position, assumptions and possible biases outlined? (Indicate how those could affect the study, in particular, the analysis and interpretation of the data)	51
4.1.6.3	Interpretation of Q2: Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation?	52
4.1.7.1	Frequency table for determination of ethical standard qualitative research studies	54
4.1.7.2	Interpretation of Q1: Are the ethics of this discussed?	55
4.1.7.3	Interpretation of Q2: Have ethical issues been adequately addressed?	55
4.1.7.4	Interpretation of Q3: Have ethical issues been taken into consideration?	56
4.1.7.5	Interpretation of Q4: Have the consequences of the research been considered i.e. raising expectations, changing behaviour?	57
4.1.8.1	Frequency table for determination of rigor in qualitative research studies.	58

4.1.8.2	Interpretation of Q1: Is the setting appropriate and/or sufficiently specific for examination of the research question?	60
4.1.8.3	Interpretation of Q2: Is sufficient detail given about the setting?	60
4.1.8.4	Interpretation of Q3: Is the design appropriate to the research question?	61
4.1.8.5	Interpretation of Q4: Is a rationale given for using a qualitative approach?	61
4.1.8.6	Interpretation of Q5: Are there clear accounts of the rationale/justification for the sampling, data collection and data analysis techniques used?	62
4.1.8.7	Interpretation of Q6: Is the selection of cases/sampling strategy theoretically justified?	62
4.1.9.1	Frequency table for determination of reliability in qualitative research studies	64
4.1.9.2	Interpretation of Q1: Intervention was described in detail?	65
4.1.9.3	Interpretation of Q2: Contamination was avoided?	65
4.1.9.4	Interpretation of Q3: Cointervention was avoided?	66
4.1.9.5	Interpretation of Q4: Did more than 1 researcher theme and code transcripts/data?	66
4.1.10.1	Frequency table for determination of credibility & trustworthiness in qualitative research studies	69
4.1.10.2	Interpretation of Q1: Were the sufficient number of references used in the study?	70
4.1.10.3	Interpretation of Q2: Are there any other noteworthy features of the study?	70
4.1.10.4	Interpretation of Q3: Has the relationship between the researcher and the participants been adequately considered?	71

LIST OF APPENDICES

APPENDIX	TITLE	PAGE NO.
I	An evaluation tools for a research study entitled Use of Evaluation Tools to Assess the Quality of MS Research Studies under Agricultural Extension Discipline in Bangladesh	81
II	Justification of the evaluation tools.	85
III	Chi-Square Test of Data collection, Sampling and Analysis	90
IV	Chi-Square Test of Validity of the findings.	90
V	Chi-Square Test of Methodology.	90
VI	Chi-Square Test of Researchers' bias.	90
VII	Chi-Square Test of Ethics.	91
VIII	Chi-Square Test of Reliability.	91

CHAPTER I

INTRODUCTION

1.1 General Background

The agriculture sector of Bangladesh is dynamic changing with, demand of the people, availability of technology, change of management practices and it requires regular adjustment with different planning and development programs. Even the country has much potential, it faces many challenges including vulnerability to climate change. For planning and sustainable development purposes, a diagnostic study of the qualitative research studies quality and its contribution on the strategic policy making in Bangladesh agriculture is required because MS level thesis and research finding(s) has a potentially powerful role to play in evidence-based practices, citations and systematic reviews of effectiveness. It may 'enhance' understanding in an area or provide 'different' sorts of evidence and insight into a problem (Davies 2000).

Performing the evaluation of quality criteria of MS research is ignored for the lack of a well-developed evaluation tool, although many accept the need for clear and transparent approaches for judging the quality or credibility of any kind of research studies. It is now almost taken for granted within the health, agriculture and social welfare sector that research studies should be grounded in best evidence and considered as knowledge. For any action, policy making or intervention designed key questions are posed: does it work(?), for whom and why(?), and what are the elements that make it work(?), in what contexts and from whose perspective(s). While there has been considerable debate about the legitimacy of different types of finding(s) and the appropriateness of different methodological approaches (Davies *et al.* 2000) within a similar type of research studies and questions over the way of knowledge accumulates, as additive (Hammersley 2001). Interest lies not just in whether the research is of high in quality, but also whether its finding(s) have relevance to the cultural and organizational context within which information is delivered and implemented

with a view to enhance the quality in decision making, adoption of new technology, innovation and the validity.

The need of the study is to select a suitable evaluation tool to assess the quality of the MS research studies as a source for collecting and analyzing data. At its most general this center on a concern with the meaning, context and depth (Temple 1998). Questions such as ‘do the findings illuminate participants’ experiences and/or understandings of the phenomenon under the study?’ (Popay *et al.* 1998) and ‘are the informants’ accounts, and if the author’s interpretations plausible?’ (Hammersley 1990) formed an important beginning. Understanding these questions is critical for the transparency or openness in the researcher’s account of ‘how the study was done’ (Lofland and Lofland 1971). Thus, ‘to what extent has the researcher provided sufficient detail of their approach to convince the reader of its rigor and appropriateness?’, ‘in what way does this study contribute to knowledge, theory and/or practice?’.

1.2 Statement of the Problem

Evaluative study of research quality of MS research in agricultural extension sector in Bangladesh is long ignored topics to work with, whereas the country’s economy, overall yearly agricultural production, problems in agriculture sector and policies taken by the government are mostly depends on the researches findings. Among those research works MS research take part attributable to the dominance to agricultural research has received far less attention. Even in the developed countries it is only in recent years that there has been an explicit focus on the systematizing the process for managing and analyzing qualitative data by Miles and Huberman (1994). Wolcott (1994) draw attention over the fact that there is an increasing acknowledgement that unless the process of data analysis is transparent it is difficult for other that the findings are not simply anecdotal.

1.3 Source of Criticism

Frequently it has been found that there is no previous work, study or research on evaluative study of the quality criteria for the MS research of agriculture extension sector in Bangladesh and the prevailing argument is unsatisfactory with

a lack of existence of any evaluative tool to assess the quality of the researches in Bangladesh. There is also no evident data about the contribution of the research finding(s) over government policy making at national level. For selecting a unique, new and future-proof title for research and to guide the future researchers with a model frame-work in evaluative study as well as develop a new theory for the betterment of the MS research quality.

1.4 Source of Interdisciplinary Insight

Evaluative study is needed by researchers to judge their own and another's work for two possible reason. Firstly, it might be argued that only if they work on the basis of explicit findings both in carrying out research and in assessing the research finding(s), will researchers can't produce reliable findings by adopting a conception of similar methodology and reflecting one strand of positivism. Secondly the given diversity of approach within the research work within the various genres should be assessed.

1.5 Specific Objectives

In order to study the above issue, the following specific objectives were formulated;

1. To select suitable evaluation tools to assess the quality of MS research studies under agricultural extension discipline in Bangladesh; and
2. To explore the quality of MS research studies under agricultural extension discipline in Bangladesh.

1.6 Justification of the Study

The study aims at evaluating and explaining the improvement of quality criteria for MS research in agricultural extension sector of Bangladesh by discussing the contexts to deal with priority and a frame-work to follow focusing on the literature of the corresponding research study(s), first to evaluate the quality of existing research works and second to follow those criteria as a guideline for the maintenance of minimum quality at the level of acceptance to match with the international standard. Specifically there are understandable and justifiable

reasons to consider among researchers in their way of assessment about the quality of any particular study, but also from significant disagreements about whether the considered research can or should be scientific, and what this means; whether it is possible to produce knowledge of social phenomena or only of the discursive practices through which they are constituted; and/or whether the immediate task of research is simply to produce knowledge or also (or instead) to serve some other practical utility as government policy making. There are some debates in the field of quality assessment of MS research designs are centered around a more theoretical approach to evaluating the quality of studies versus an evaluation of the technical adequacy of a research design and literature writing. In the context of agricultural extension sector of Bangladesh research should have some clear implications for policy and practice, this means indicating the relevance of research to a variety of different stakeholders for whom research is the only source of guidance in decision making.

With a view to change this condition a set of quality assessment tools should have been considered to assist in the study of the MS research's quality criteria. The selected evaluation tool must be reflecting the uniqueness of the MS research paradigm, in particular, its concerns with meaning, context and depth and emphasis lies on the areas of study context and the process of data collection and analysis as well as the relevance of the study to the new agriculture extension policy.

CHAPTER II

REVIEW OF LITERATURE

A qualitative research is defined as one that uses qualitative methods in both the gathering and analysis of the data, that is, visual and verbal (conceptual or thematic) rather than numerical data manipulation. Its aim is to draw out the informants' understandings and perceptions as well as to explore the features of social settings and culture (Long et al. 2004). Qualitative research could thus encompass studies using methods such as interviewing, focus groups, ethnography, participant observation, documentary analysis and life histories. The collected data are intended to illuminate the meanings attached by individuals to events and situations (Bryman 1988) and to understand the dynamics of social life (Whyte 1997) and the linkages between processes and outcomes (Stake 1995). Emphasis is placed on understanding a phenomenon holistically, that is, from different perspectives and bounded by the context or setting within which it is located. The questions of 'how' and 'why' are paramount (Fitzpatrick and Boulton 1994). Moreover, many papers identified as 'qualitative' in health, agriculture and social care journals commonly report on small-scale open-ended interview studies, with the resultant data grouped into themes (Boulton et al. 1996).

2.1 Developing the content of the evaluation

Any evaluative study is need to reflect the uniqueness of the qualitative research endeavor as a method for collecting and analyzing data. At its most general this center on a concern with meaning, context and depth (Temple 1998). Questions such as 'do the findings illuminate participants' experiences and/or understandings of the phenomenon under study?' (Popay *et al.* 1998) and 'are the informants' accounts, and the author's interpretations plausible?' (Hammersley 1990) formed an important beginning. Underlying these questions is the criticality of a transparency or openness in the author's account of 'how the study was done' (Lofland and Lofland 1971). Thus, 'to what extent has the author provided

sufficient detail of their approach to convince the reader of its rigor and appropriateness'? These questions lead first of all to a focus on factors related to the context of the study and this could be broken down into a number of inter-related components.

2.2 Core criteria for quality evaluation

Quality evaluation is “the process of systematically examining research evidence to assess its validity, results and relevance before using it to inform a decision” (Hill & Spittlehouse, 2003). Instruments developed to support quality evaluation usually share some basic criteria for the evaluation of qualitative research. These include the need for research to have been conducted ethically, the consideration of relevance to inform practice or policy, the use of appropriate and rigorous methods and the clarity and coherence of reporting (Cohen & Crabtree, 2008). Other criteria are contested, such as the importance of addressing reliability, validity, and objectivity, strongly related to researcher bias. Qualitative research as a scientific process needs to be “rigorous” and “trustworthy” to be considered as a valuable component of any systematic review. Therefore, an evaluation using such criteria is essential.

2.3 Validity of the finding(s)

One contemporary dialogue has centered on the difficulty of establishing validity criteria in qualitative research. It is commonly accepted that certainty in scientific inquiry is futile (Maxwell, 1990), validity standards in qualitative research are even more challenging because of the necessity to incorporate both rigor and subjectivity as well as creativity into the scientific process (Johnson, 1999). In addition, disparate qualitative methods espouse different evaluative criteria. How can quality in qualitative research be discerned within such an ambiguous and intangible framework? What distinguishes science from pseudoscience? Has qualitative research become so diversified that overarching guidelines of validity are impossible, or are there specific criteria that cross methodological and philosophical differences? (Forbes *et al.*, 1999) contended that specific warrants for knowledge claims that transcend philosophical and methodological boundaries

are both possible and necessary. (Emden and Sandelowski, 1998), although recognizing the diversity of qualitative traditions coupled with the infinitely different assumptions of investigators, believed that the pursuit of common goodness criteria is both necessary and worthy in qualitative research. A post positivist qualitative study logically attaches itself to standards of inquiry framed in conventional terms: “internal validity (isomorphism of findings with reality), external validity (generalizability), reliability (in the sense of stability), and objectivity (distanced and neutral observer)” (Guba & Lincoln, 1994). (Patton, 2002) referred to these criteria as “traditional scientific research criteria” and included “objectivity of the inquirer (attempts to minimize bias), validity of the data, systematic rigor of fieldwork procedures, triangulation (consistency of findings across methods and data sources), reliability of coding and pattern analyses, correspondence of findings to reality, generalizability (external validity), strength of evidence supporting causal hypotheses, and contributions to theory”.

2.4 Literatures on quality of research methodology

There are five types commonly used in educational research: (a) basic or generic; (b) ethnography; (c) phenomenology; (d) grounded theory; and (e) case study. For the basic or generic study, a researcher would include description, interpretation, and understanding in the form of recurrent patterns, themes or categories (Merriam, 1998). This is the most common type of qualitative method used in agricultural education. Ethnography focuses on society and culture from the anthropological view. The study seeks to uncover and describe beliefs, values, and attitudes that impact group behavior (Merriam, 1998). Ethnography involves extensive fieldwork because it is through direct observations (participant observation) of the activities, communications and interactions with the people that the results emerge (Atkinson & Hammersley, 1994; Moustakas, 1994). This approach requires skill with writing detailed field notes and gathering a variety of information from different perspectives. Quotations should be used to represent participants’ viewpoints in their own words (Moustakas, 1994). This approach would be appropriate for classroom-based and extension education research. Phenomenology is based upon experiential underpinnings of knowledge from the

field of sociology (Holstein & Gubrium, 1994). All qualitative research has its philosophical roots in phenomenology, but there are distinctions that make a study a phenomenological one. Empirical phenomenological research is concerned with the essence or structure of a phenomenon. It uses data that are the participant's and researchers' firsthand experiences (Merriam, 1998; Moustakas, 1994). (Patton, 2002) essences are the core meanings mutually understood through a phenomenon commonly experienced. The approach "involves a return to the experience in order to obtain comprehensive descriptions that provide the basis for a reflective structural analysis that portrays the essences of the experience" (Moustakas, 1994). Grounded theory is designed to build a substantive theory regarding some aspect of practice in the real world (Merriam, 1998). The approach is focused on understanding the nature and meaning of an experience for a particular group of people in a particular setting (Glaser & Strauss, 1967). (Strauss and Corbani, 1990) grounded theory should be true to everyday reality, make sense to those involved, and be applicable to a variety of related contexts. Grounded theory researchers continually question gaps in the data and stress open processes. Context and social structure are important in order to generate theory and data. Data collection, coding, and analysis occur simultaneously. It is an inductive process where theory must be grounded in the data (Moustakes, 1994). Case studies can be used in both quantitative and qualitative research. Case study is an intensive, holistic description and analysis of a single unit or bounded system and can be combined with any of the other types previously mentioned (Merriam, 1998). (Stake, 1994) "The reader comes to know some things told, as if he or she had experienced them. Case study research includes "detailed contextual analysis of a limited number of events or conditions and their relationships" (Dooley, 2002). A good case includes the setting, characters, events, problems, and conflicts, much like a richly detailed story.

2.5 Evaluation of aim of the research

The research aim (or goal, or purpose) gives a broad indication of what the researcher wishes to achieve in the research. The research aim is a concise, clear statement of the specific goal of the study (Burns & Grove, 2005). The aim

usually indicates the type of study to be conducted, i.e., identify, describe, explain, or predict. (Mouton and Marais, 1994; also compare Mouton, 1996) Presents a classification of different types of research studies to present “a more systematic picture of different kinds of research objectives”. However, he suggests that there are more basic questions to consider, before attention is given to the classification. (Mouton, 1996) Further argues over the factors that determine the clarification of the research purpose, such as “the researchers’ existing background knowledge (epistemic dimension) of the particular phenomenon and the interests, motives and preferences of the researcher (the sociological dimension)”. In summary, the research purpose is logically (deduced) generated from the research problem, it identifies the purpose of the study, and directs the development of the study (Burns & Grove 2005). Often researchers refer to the case study primarily as a style for reporting the results of a qualitative study. Case studies can be used in both quantitative and qualitative research. Case study is an intensive, holistic description and analysis of a single unit or bounded system and can be combined with any of the other types previously mentioned (Merriam, 1998). (Stake, 1994) “The reader comes to know some things told, as if he or she had experienced them. Case study research includes “detailed contextual analysis of a limited number of events or conditions and their relationships” (Dooley, 2002).

2.6 Literatures on research paradigm

No research is value free. “All studies include assumptions about the world and knowledge that informs the inquiries” (Creswell & Plano Clark, 2007). Although some social science researchers (Lincoln & Guba, 1985; Schwandt, 1989) perceive qualitative and quantitative approaches as incompatible, others (Patton, 2002; Reichardt & Cook, 1981) believe that the skilled researcher can successfully combine approaches. The argument usually becomes muddled because one party argues from the underlying philosophical nature of each paradigm, and the other focuses on the apparent compatibility of the research methods, enjoying the rewards of both numbers and words. Because the positivist and the interpretivist (an approach to social science that opposes the positivism of

natural science. Qualitative research, a method of inquiry in social science and related disciplines) paradigms rest on different assumptions about the nature of the world, they require different instruments and procedures to find the type of data desired. This does not mean, however, that the positivist never uses interviews nor that the interpretivist never uses a survey.

2.7 Literatures on data collection

It is most common for qualitative data, collected primarily as text or images, to be analyzed using qualitative methods. Qualitative researchers argue that the data to be analyzed already reflect an analytical process. Interview responses, for example, even if digitally recorded, are still shaped by the interaction of the subject and the researcher (Clandinin and Connelly 1994), sometimes shifting the direction of the research inquiry. (Huberman and Miles, 1994) underline this point in their description of three linked components of qualitative data analysis: (1) data reduction, (2) data display, and (3) data verification and conclusion drawing. Data reduction involves shaping the final set of materials for analysis. This is a continuous, iterative process that occurs throughout the qualitative research process. In ethnography, for example, researchers take a holistic approach to data collection, but as they narrow down their research question, perhaps to decision making about agricultural production, they would put to one side the information they might have collected about pregnancy and childbirth. Data display is a process of organizing the data and looking for relationships, often using a range of organizing techniques such as diagramming networks, matrixes fill with text, or written syntheses, scenarios, or summaries. The final stage of conclusion drawing involves comparing and contrasting, sorting, clustering, and documentation. Analysis or interpretation of quantitative results can also be treated to qualitative inquiry, providing information about context, looking at outliers, and questioning about the researcher-subject relationship (Guba and Lincoln 1994).

2.8 Literatures on researchers' bias

Qualitative researchers, whether in the tradition of sociology or anthropology, have straggled over the year with the charges that it is too easy for the prejudices

and attitude of the researchers to bias the data (Bogdan & Biklen, 1982). Particularly when the data must “Go through” the researchers mind before it is put on paper, the worry about subjectivity arises. Does perhaps the observer record only what he or she wants to see rather than what is actually there? Qualitative researchers are concerned with the effect their own subjectivity may have on the data they produce. Critics of qualitative inquiry have charged that the approach is too subjective, in large part because the researchers is the instrument of both data collection and data interpretation, and because a qualitative strategy includes having personal contact with and getting close to the people and the situation under the study (Patton, 1990). The problem is that “we have few agreed-on-cannons for qualitative data analysis, in the sense of shared ground rules for drawing conclusions and verifying their sturdiness” (Miles & Huberman, 1984). There is no ways and no straightforward tests for perfectly determining the researchers analytical thought processes.

2.9 Literatures on ethical standard

Qualitative research introduces special moral and ethical problems that are not usually encountered by other researchers during data collection; perhaps due to the unstructured conversational tone of interviews and the intimate nature of the interaction between the researcher and participants (Morse & Field, 1995). It is therefore very important that the researcher take special care in ensuring that ethical standards are met. Ethical considerations refer to the protection of the participants’ rights, obtaining informed consent and the institutional review process (ethical approval). The researcher needs to provide adequate information on each of these aspects. Protection of participants’ rights include the right to self-determination, right to privacy, right to autonomy and confidentiality, right to fair treatment and the right to protection from discomfort and harm. Informed consent needs to be obtained from the participants, as well as the research site and the relevant authorities (H Klopper, 2008).

2.10 Literatures on rigor

Rigor must be reflected throughout the research. However, it is vital that the researcher addresses rigor specifically, using relevant criteria and appropriate strategies for the qualitative design used. (Lincoln and Guba, 1985) Propose an alternative construct for validity and reliability in qualitative research, namely trustworthiness. The epistemological standards of trustworthiness are:

Truth value:

Truth value determines whether the researcher has established confidence in the truth of the findings with the participants and the context in which the research was undertaken. Truth value is usually obtained from the discovery of human experiences as they are lived and perceived by the participants (Klopper & Knobloch, 2008, Sliep, Poggenpoel & Gmeiner, 2001). Truth value is obtained by using the strategy of credibility and the criteria of prolonged engagement, triangulation (of methods, data sources, theories and investigators), peer examination/group discussion, negative case analysis and member checking.

Applicability:

Applicability refers to the degree to which the findings can be applied to different contexts and groups (Sliep *et al.* 2001). It is the ability to generalize from the findings to larger populations, by using the strategy of transferability (Klopper & Knobloch, 2008).

Consistency:

Consistency considers whether the findings will be consistent if the inquiry was replicated with the same participants and in a similar context. Since the qualitative setting may be complicated by extraneous and an unexpected variable, the strategy of dependability is used, which implies traceable variability; this is variability that can be ascribed to identifiable sources (Sliep *et al.* 2001). To ensure consistency (Guba and Lincoln, 1985) discuss direct and indirect ways with which the dependability of research findings may be ensured. Dependability may be ensured in an indirect way by applying the measures of credibility. The

three direct ways that the dependability of research findings may be ensured are: stepwise replication (inclusive of a thick or dense description of the methodology), inquiry audit (sometimes referred to as the dependability audit) and triangulation (Klopper & Knobloch, 2008).

Neutrality:

Neutrality entails freedom from bias during the research process and results description, and refers to the degree to which the findings are a function solely of the informants and conditions of the research, and not of other biases, motives or perspectives (Sliep *et al.* 2001). The strategy of confirmability is used, and the criteria of the confirmability audit and triangulation are applied (Klopper & Knobloch, 2008).

2.11 Literatures on reliability

In quantitative research, reliability refers to exact replicability of the processes and the results. In qualitative research with diverse paradigms (Grossoehme, 2014), such definition of reliability is challenging and epistemologically counter-intuitive. Hence, the essence of reliability for qualitative research lies with consistency (Carcary, 2009). A margin of variability for results is tolerated in qualitative research provided the methodology and epistemological logistics consistently yield data that are ontologically similar but may differ in richness and ambience within similar dimensions. (Silverman, 2009) proposed five approaches in enhancing the reliability of process and results: Refutational analysis, constant data comparison, comprehensive data use, inclusive of the deviant case and use of tables. As data were extracted from the original sources, researchers must verify their accuracy in terms of form and context with constant comparison, (George and Apter, 2004) either alone or with peers (a form of triangulation). The scope and analysis of data included should be as comprehensive and inclusive with reference to quantitative aspects if possible, and also adopting the *Popperian dictum* of falsifiability as essence of truth and science (Patton, 1999), attempted to refute the qualitative data and analytics should be performed to assess reliability. (Allmark, 2003)

2.12 Literatures on credibility & trustworthiness

Credibility refers to the truth of the data or the participant views and the interpretation and representation of them by the researcher (Polit & Beck, 2012). Credibility is enhanced by the researcher describing his or her experiences as a researcher and verifying the research findings with the participants. A qualitative study is considered credible if the descriptions of human experience are immediately recognized by individuals that share the same experience (Sandelowski, 2002). Specific strategies can be employed by the researcher to address those multiple criteria. Strategies performed in each phase of the research process not only attain the criteria, but also enrich the credibility and trustworthiness of the study (Polit & Beck, 2012). Thorough data collection and fieldwork are essential when conducting qualitative research. Researcher strategies that facilitate this process include prolonged engagement, persistent observation, and reflexivity (Houghton *et al.*, 2013; Lincoln & Guba, 1985).

2.13 Stages in the evaluation of research study

Three different stages can be identified in a quality evaluation exercise: filtering, technical appraisal and theoretical appraisal.

Stage 1: Filtering:

Within the specific context of enhancing or extending Cochrane Reviews, and viewing critical appraisal as a technical and paradigmatic exercise, it is worth considering limiting the type of studies to be included in a systematic review (Morse *et al.*, 2002). We suggest restricting included research reports to empirical studies with a description of the sampling strategy, data collection procedures and the type of data-analysis considered. This should include the methodology chosen and the methods or research techniques opted for, which facilitates the systematic use of critical appraisal as well as a more paradigmatic appraisal process. Descriptive papers, editorials or opinion papers would generally be excluded.

Stage 2: Technical appraisal:

Any evaluative study should be considered a technical tool to assist in the appraisal of qualitative studies, looking for indications in the methods or discussion section that add to the level of methodological soundness of the study. This judgement determines the extent to which the reviewers may have confidence in the researcher's competence in being able to conduct research that follows established norms (Morse *et al*, 2002) and is a minimum requirement for critical assessment of studies. Criteria include but are not limited to the appropriateness of the research design to meet the aims of the research, rigor of data-collection and analysis, well-conducted and accurate sampling strategy, clear statements of findings, accurate representation of participants' voices, outline of the researchers' potential influences, background, assumptions, justifications of the conclusion or whether or not it flows from the data, value and transferability of the research literature etc.

Stage 3: Theoretical appraisal:

In addition to assessing the fulfillment of technical criteria we suggest a subsequent, paradigmatic approach to judgment, with a focus on the research paradigm used in relation to the findings presented. Although some critical appraisal instruments integrate criteria related to theoretical frameworks or paradigms most of them are pragmatic. These do little to identify the quality of the decisions made, the rationale behind them or the responsiveness or sensibility of the researcher to the data. Therefore, a consideration of other criteria should be considered. This would e.g., include an evaluation of methodological coherence or congruity between paradigms that guide the research studies and the methodology and methods chosen, an active analytic stance and theoretical position, investigator responsiveness and openness and verification, which refers to systematically checking and confirming the fit between data gathered and the conceptual work of analysis and interpretation (Morse *et al*, 2002).

CHAPTER III

MATERIALS AND METHODS

A researcher should do work very carefully in formulating methods and procedures. Methodology gives clear direction to a researcher about his works and activities during the whole period of the study. Appropriate procedures for collecting data were taken by the researcher to collect valid and reliable information. Methods of analysis were appropriate to arrive at correct conclusion. Various methods, tools and techniques were used during different stages of this research work and compilation of data. The purpose of this chapter was to describe the setting, methods and procedures used in conducting this study.

3.1 Methodological approach and research design of the study

This study contained qualitative research approaches in order to get a comprehensive view of the quality of the MS research studies under agricultural extension discipline of Bangladesh. The quantitative survey (Evaluation tools) approach was used for determining some selected characteristics of the quality of the MS research studies for determining the extent of quality and contribution towards policy making for the agricultural development. For the selection of suitable evaluation tools a set of well-established evaluation tools was considered because most of the evaluation tools was developed with a view to assess specific quality criteria in a selected group of research studies. As the subject matter of choice for the MS research studies under agricultural extension discipline of Bangladesh is diverse, a mixed method research design was applied considering the MMAT approach introduced by Hong *et al.* (2018).

3.2 Locale of the Study

The study was conducted by considering SAU online thesis archive containing the journals and MS, PhD thesis. Among those MS thesis papers of agricultural extension discipline were considered as the population sample for the study. SAU online archive is one of the richest archives considering the number of available

thesis papers (6998) of post-graduation level containing journals, MS and PhD thesis form the major agricultural universities of Bangladesh. This is the reason behind the selection of this SAU online thesis archive as the locale of the study.

3.3 Sampling design

MS thesis papers of agricultural extension discipline were selected from SAU online digital archive, (SAUL archive). List of the MS thesis papers of agricultural extension discipline were prepared by the cooperation of MS research studies under 10 different and most frequently chosen subject matters. Population of that selected topics (MS studies under agricultural extension studies) was 850. From the entire population, 90 MS studies were taken as a sample size through using standard formula (Moral, 2011) with 10% marginal error and selected them by random sampling method. A reserve list of 10 MS studies was also prepared if the MS studies included in the original sample were not available/missing considered criteria during data collection period.

Sample size is,

$$\begin{aligned}n &= N / (1 + Ne^2) && \text{Here, } n = \text{Sample size} \\ &= 850 / \{1 + (850 \times 0.1^2)\} && N = \text{Population size} \\ &= 89.47 \sim 90 && e = \text{Marginal error (0.1\%)}\end{aligned}$$

Table 3.1 Population and sample of MS thesis papers of agricultural extension discipline

SL NO.	Subject matter	Total no. of thesis paper
1	Farmers knowledge/awareness/attitude	9
2	Adoption of new technology/method/cultivation technique	9
3	Rural Women's & youths Participation/Empowerment	9
4	Impact/Use/Effect of Media/Communication/ICT	9
5	Effect of Project/Training/Program/Practice/Demonstration	9
6	NGOs/NGOs Project/Training/Micro credit	9
7	Job Performance/Satisfaction of Government Employees	9
8	Farmers Problems/Constraints	9
9	HYV/Modern Variety/Improved Variety Cultivation	9
10	Climate Change/Nature & Post Production Management/lose	9
Total		90

3.4 Selection of the variables

In a qualitative research, selection and measurement of variables is a significant task. Ezekel and fox (1969) defined a variable as any measurable characteristics which can assume varying or different values in successive individual areas. It is essential to delineate the problem and decide the variable where relationships are involved, because relationships are fundamental staff out of which all sciences are built. To assess the quality of MS research studies of agricultural extension discipline using a set of evaluation tools, the following variables (Independent Variable) will be considered.

- i. Validity of the finding(s)
- ii. Methodology
- iii. Aim of the research
- iv. Research paradigm

- v. Data collection & analysis
- vi. Researchers' bias
- vii. Ethical standard
- viii. Rigor
- ix. Reliability
- x. Credibility & trustworthiness

3.5 Instrumentation

In order to collect relevant data, a well-structured evaluation tool was selected keeping the objectives of the study in mind. The questions and statements contained in the schedule were simple, direct and easily understandable. The evaluation tool contained mainly closed form questions. Scales were included in the schedule, wherever necessary. The evaluation tool was pre-tested with 20 MS thesis papers. Based on the pre-test necessary corrections were made in the evaluation tool. The research instrument included the following major information of MS thesis papers of agricultural extension discipline ten (10) characteristics namely; Validity of the finding(s), Methodology, Aim of the research, Research paradigm, Data collection, Researchers' bias, Ethical standard, Rigor, Reliability and Credibility & trustworthiness.

3.6 Methods and procedure of data collection

In the survey researcher himself collected data from 90 MS thesis papers of agricultural extension discipline. The questions were simplified to avoid difficulties in understanding. No serious difficulty was faced by the researcher in collecting data. The survey was conducted in 1st to 15th November 2019.

3.7 Processing of the data

Collected data were coded, recoded and transferred into SPSS (Statistical Package for Social Science) software package (Version 25.0). This package helps to perform a wide range of statistical analyses.

3.8 Measurement of the variables

The independent Variables of this study were (10) selected characteristics. These were Validity of the finding(s), Aim of the research, Methodology, Research paradigm, Data collection, Researchers' bias, Ethical standard, Rigor, Reliability and Credibility & trustworthiness.

3.8.1 Validity of the finding(s)

Measurement of the validity of the finding(s) of any qualitative research studies answer of some key questions must be present. The evaluation tools developed by Andrew Long and Godfrey (2004) with the title 'An evaluation tool to assess the quality of qualitative research studies', published in 'International Journal of Social Research Methodology Theory and Practice' was considered as standard here and 5 key closed form question was selected and rearranged as per the context of the MS thesis papers of agricultural extension discipline in Bangladesh. The scoring for the answer yes was 1 and for the answer no 0.

3.8.2 Aim of the Research

Determination of the aim of the qualitative research studies two (2) key questions was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). The scoring for the answer yes was 1 and for the answer no 0.

3.8.3 Methodology

Accuracy in methodology in any qualitative research is difficult to identify rather identifying which type of methodology used was considered in the following study. Five (5) key question was selected to evaluate the methodological criteria from Hong *et al.* (2018). The scoring for the answer yes was 1 and for the answer no 0.

3.8.4 Research Paradigm

Determination of research paradigm qualitative research studies one (1) key question was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). The scoring for the answer yes was 1 and for the answer no 0.

3.8.5 Data Collection and analysis

Determination of data collection qualitative research studies seven (7) key questions was selected from Spencer *et al.* (2003). The scoring for the answer yes was 1 and for the answer no 0.

3.8.6 Researchers' Bias

Determination of the researchers' bias of the qualitative research studies two (2) key questions was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). The scoring for the answer yes was 1 and for the answer no 0.

3.8.7 Ethical Standard

Determination of ethical standard qualitative research studies four (4) key questions was selected from Spencer *et al.* (2003). The scoring for the answer yes was 1 and for the answer no 0.

3.8.8 Rigor

Determination of rigor in qualitative research studies six (6) key questions was selected from Spencer *et al.* (2003). The scoring for the answer yes was 1 and for the answer no 0.

3.8.9 Reliability

Determination of reliability in qualitative research studies five (5) key questions was selected from Spencer *et al.* (2003). The scoring for the answer yes was 1 and for the answer no 0.

3.8.10 Credibility & trustworthiness

Determination of credibility & trustworthiness in qualitative research studies three (3) key questions was selected from Spencer *et al.* (2003). The scoring for the answer yes was 1 and for the answer no 0.

3.9 Data analysis strategy

The collected data were coded, compiled, tabulated, and analyzed in accordance with the objectives of the study. Score is given where it is necessary. Descriptive statistics such as range, mean and standard deviation were used for describing the variables of the study. As we know data from an agricultural experiment can either be measurement data or attribute data. Measurement data is specified along a continuous numerical scale, but attribute data is concerned with a finite number of discrete classes. The most common types of attribute data are those having two classes, which consist of the presence or absence of an attribute such as male or female, success or failure, effective or ineffective, and dead or alive. Following study contains these type of attribute data so, Chi-square test was done. (Gomez and Gomez, 1984). Chi-square test was used to explore the relationships between any two concerned variables. The analysis of data was performed by using SPSS (Statistical Package for Social Sciences) computer program. Throughout the study, at least five percent (0.05) level of probability was used as a basis for rejecting a null hypothesis.

CHAPTER IV

RESULTS & DISCUSSION

This Chapter compiles with the data that is collected by reviewing the MS research studies under agricultural discipline of Bangladesh and have been coded, treated, tabulated and statistically analyzed according to the objectives of the study, which is thoroughly called result and discussion. The findings of the study and interpretations of the results have been presented in this Chapter. Logical argument, appropriate interpretation and to the point explanation were presented to make the research findings comprehensible, reliable and widely admittable. The results and discussion have been presented under the following topics:

- Explanation of the elements of the evaluation tool used for the assessment.
- Exploring the evaluation tool and its implication on the quality of MS research studies under agricultural extension discipline in Bangladesh.

4.1 Explanation & Exploring the evaluation tool and its implication on the quality of MS research studies under agricultural extension discipline in Bangladesh.

“Methods are not procedures to be followed in any standardized way, but rather are created anew in every research project by researchers who hold their work to a standard.” (Sandelowski, 2008).

To assess the merit of a qualitative study, are available closed tools, like the checklists that contain a large number of items and predetermined score sheets; and open tools with a small number of criteria for the researchers to use them as guidelines. In fact, many of the closed score sheets were elaborated to help people who were not familiar with the qualitative method. On the other hand, the closed score sheets tend to present the research as a set of procedures to comply with and can promote the elaboration of reports with quality jargon but void of contents. A review using an open tool that comments on the strengths and weaknesses of their work is undoubtedly more useful than a report in which it is indicated what was

complied with and what was not. Considering these complications closed tools are used to exploring the quality of MS research studies under agricultural extension discipline in Bangladesh.

The tools used for the assessment of the quality of MS research studies under agricultural extension discipline in Bangladesh is inevitably lengthy (it aims to be comprehensive) and written at a high level of generality (it provides a guide on the aspects to explore). Importantly, it incorporates both descriptive ('what was done') and evaluative ('how well it was done') elements. Thus, it includes characteristics of the study (study type, sampling and setting) and how the study was done (rationale for the choice of setting, sample, data collection and analysis). This questionnaire thus provides a framework for describing and thinking about qualitative research in a context where the purpose is evaluation of the quality of the literature.

To enhance the utility and communicability of the tools used here, a front end was designed to provide an overview of the study, in the form of an evaluative abstract. This indicates the purpose of the study, key findings, an evaluative summary of the strengths and weaknesses of the study. The summary enables a researcher to quickly grasp the essential details of a study and its potential value. It can provide one part of the information set, and knowledge base about the subject matter of any selected study.

Among the MS thesis papers of agricultural extension discipline by the cooperation of qualitative research studies 10 different and most frequently chosen subject matters was selected and interpreted as group, those were;

- Group 1 Farmers knowledge/awareness/attitude
- Group 2 Adoption of new technology/method/cultivation technique
- Group 3 Rural Women's & youths Participation/Empowerment
- Group 4 Impact/Use/Effect of Media/Communication/ICT
- Group 5 Effect of Project/Training/Program/Practice/Demonstration

- Group 6 NGOs/NGOs Project/Training/Micro credit
- Group 7 Job Performance/Satisfaction of Government Employees
- Group 8 Farmers Problems/Constraints
- Group 9 HYV/Modern Variety/Improved Variety Cultivation and
- Group 10 Climate Change/Nature & Post Production Management/lose. This would make sure the most frequent implication of the tools used and effectiveness of tools used for the assessment.

Chi-square test was performed as the A chi-square (χ^2) statistic is a measure of the difference between the observed and expected frequencies of the outcomes of a set of events or variables. χ^2 depends on the size of the difference between actual and observed values, the degrees of freedom, and the samples size. χ^2 can be used to test whether two variables are related or independent from one another or to test the goodness-of-fit between an observed distribution and a theoretical distribution of frequencies. χ^2 provides a way to test how well a sample of data matches the (known or assumed) characteristics of the larger population that the sample is intended to represent. If the sample data do not fit the expected properties of the population that we are interested in, then we would not want to use this sample to draw conclusions about the larger population.

4.1.1 Validity of the finding(s)

Considerations in assessing the validity of findings

1. The main claims and evidence:

- Are the main claims plausible enough to be accepted as information?
- If so, is the evidence sufficient, both in terms of strongly implying the validity of the main knowledge claim and in being sufficiently plausible or credible to be accepted?
- If not, is a further layer of evidence provided?
- If so, is this evidence sufficient? And so on.

2. The relationship between the findings about the topics studied and the conclusions drawn:

- Where these are empirical generalizations about some finite population, on the basis of whatever evidence is provided, are they sufficiently plausible or credible to be accepted?
- Either there are theoretical statements of a conditional causal kind, on the basis of the evidence provided, are they sufficiently plausible or credible to be accepted?

3. Considering the finding following should be considered;

- if the results/findings been discussed in relation to the aims of the study or the research question.
- if adequate reasoning about the results is presented or if the results comprise merely citations/presentation of data.
- if the results are presented clearly (e.g., is it easy to distinguish between citation/data and the researcher's own input).
- if the results are presented with reference to the theoretical explanation or proposal on which the data collection and analysis were based.
- if adequate data have been presented to support the results to what extent contradictory data have been highlighted and presented.

Measurement of the validity of the finding(s) of any qualitative research studies answer of some key questions must be present. The evaluation tools developed by Andrew Long and Godfrey (2004) with the title 'An evaluation tool to assess the quality of qualitative research studies', published in 'International Journal of Social Research Methodology Theory and Practice' was considered as standard here and 5 key closed form question was selected. Only for the question 4 30% of the time the output was negative. (Table 4.1.1.1)

Table 4.1.1.1: Frequency table of measurement of the validity of the finding(s)

		Frequency	Percent	SD
Q1	yes	90	100.0	.000
Q2	yes	90	100.0	.000
Q3	yes	90	100.0	.000
Q4	yes	63	70.0	.461
	no	27	30.0	
Q5	yes	90	100.0	.000

All 4 key questions were analyzed and the outcome suggest that, for question 1 Were the outcome measures valid? Was asked all 10 groups was able to give positive feedback. Considering question 2 Were the outcome measures valid? Was asked and similar out like previous was measured. For question 3 Were outcome criteria are used in the study valid? The trend was similar. Although question 4 interpretation results different outcome for the question of. Is there sufficient breadth (e.g. contrast of two or more perspective) and depth (e.g. insight into a single perspective)? Where qualitative studies from all 10 groups gave negative response for at least 2 following studies and highest 4 negative count from group 10 with 14.8% expected count. This result suggested that, qualitative studies titled with Climate Change/Nature & Post Production Management/lose, was difficult to ensure the contrast of two or more perspective or insight into a single perspective and it was likely to express broader outcome than a single or specific finding. The Chi-square value of 2.288^a with the likelihood ratio of 2.277 suggested that $p < 0.05$ (it is now 0.04) and we reject the null hypothesis in favor of the alternative hypothesis. (Appendix IV)

Table 4.1.1.2: Interpretation of Q1: Were the outcome measures valid?

			Groups										Total	
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10		
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.1.3: Interpretation of Q2: Were the outcome measures reliable?

			Groups										Total	
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10		
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.1.4: Interpretation of Q3: Were outcome criteria are used in the study valid?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q3	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q3	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.1.5: Interpretation of Q4: Is there sufficient breadth (e.g. contrast of two or more perspective) and depth (e.g. insight into a single perspective)?

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q4	no	Count	2	2	3	3	2	2	3	3	3	4	27
		% within q4	7.4%	7.4%	11.1%	11.1%	7.4%	7.4%	11.1%	11.1%	11.1%	14.8%	100.0%
	yes	Count	7	7	6	6	7	7	6	6	6	5	63
		% within q4	11.1%	11.1%	9.5%	9.5%	11.1%	11.1%	9.5%	9.5%	9.5%	7.9%	100.0%

Table 4.1.1.6: Interpretation of Q5: Are the findings clearly presented?

			Groups									Total	
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9		Group 10
Q5	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q5	10.0%	10.0%	1.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.2 Aim of the Research

The following aspects should be considering the aim of the study

- why it is important
- its relevance
- whether qualitative research methods are appropriate for investigating the field/answering the research question.

Determination of the aim of the qualitative research studies two (2) key questions was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). All the question response positively. (Table 4.1.2.1)

Table 4.1.2.1: Frequency of determination of the aim of the research

		Frequency	Percent	SD
Q1	yes	90	.000	100.0
Q2	yes	90	.000	100.0

The interpretation of these questions Are the findings relevant to the aims of the study? And was the purpose stated clearly? Gave positive response considering 10% expected count from each group. This value represents that, the aim of the research of the qualitative studies of MS degree under agricultural discipline were able to eradicate the limitations in their literature by expressing the aim of the research with appropriate manners.

Table 4.1.2.2: Interpretation of Q1: Are the findings relevant to the aims of the study?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.2.3: Interpretation of Q2: Was the purpose stated clearly?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.3 Methodology

Considerations in assessing of methodological evaluation

It is important to recognize that several different kinds of evaluative judgment can be involved in research, focused on different objects and serving different purposes. At least the following possibilities can be identified:

- Assessing how well a study is presented in a research report, in terms of whether it is clear and provides all the information we need.
- Assessing the findings of a study, or of a body of research, to determine whether they should be believed.
- Assessing a piece of research or a body of research studies to decide whether they were carried out well.
- Assessing a study or group of studies in order to judge whether the methods they employed are ones that seem likely to be fruitful in other contexts.
- Assessing the expertise or competence of particular researchers on the basis of the work they have produced; for example, in order to decide whether they should be awarded a MS degree.

Accuracy in methodology in any qualitative research is difficult to identify rather identifying which type of methodology used was considered in the following study. Five (5) key question was selected to evaluate the methodological criteria from Hong *et al.* (2018). Only for the question 4 24.4% of the response were negative. (Table 4.1.3.2)

Table 4.1.3.1: Frequency table of Accuracy in methodology

		Frequency	Percent	SD
Q1	yes	90	100.0	.000
Q2	yes	90	100.0	.000
Q3	yes	90	100.0	.000
Q4	yes	68	75.6	.432
	no	22	24.4	
Q5	yes	90	100.0	.000

Comparing the studies methodology from MS research studies under agricultural Extension discipline. 4 out of 5 questions (Is the sampling strategy relevant to address the research question? Is the sample representative of the target population? Are the measurements appropriate? And Is the statistical analysis appropriate to answer the research question?) from every 10 groups gave positive outcome expressing the accuracy of the required criteria of a quality research. But for question 4 asking Is the risk of nonresponse bias low? Failed to outcome positive results as at least one study from every groups with 4 studies from group 1 (18.2% expected count) was failed to fulfill the criteria. The Chi-square value of 5.84^a with the likelihood ratio of 5.99 suggested that $p < 0.05$ (it is now 0.04) and we reject the null hypothesis in favor of the alternative hypothesis. (Appendix V)

Table 4.1.3.2: Interpretation of Q1: Is the sampling strategy relevant to address the research question?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.3.3: Interpretation of Q2: Is the sample representative of the target population?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.3.4: Interpretation of Q3: Are the measurements appropriate?

			Groups										Total	
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10		
Q3	yes	Count	9	9	9	9	9	9	9	9	9	9	9	90
		% within q3	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.3.5: Interpretation of Q4: Is the risk of nonresponse bias low?

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
q4	no	Count	4	3	3	3	1	1	2	2	2	1	22
		% within q4	18.2%	13.6%	13.6%	13.6%	4.5%	4.5%	9.1%	9.1%	9.1%	4.5%	100.0%
	yes	Count	5	6	6	6	8	8	7	7	7	8	68
		% within q4	7.4%	8.8%	8.8%	8.8%	11.8%	11.8%	10.3%	10.3%	10.3%	11.8%	100.0%

Table 4.1.3.6: Interpretation of Q5: Is the statistical analysis appropriate to answer the research question?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q5	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q5	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.4 Research Paradigm

The following aspects should be considered;

- whether the researcher has presented the background to the chosen method of sample selection.
- whether the researcher has presented the procedure for selecting the participants.
- whether the researcher has presented the reasons for selecting the participants.
- whether the researcher has stated the number of participants selected.
- whether the researcher has described whether anyone declined to participate and if so, why
- whether the researcher emphasizes ethical aspects in more detail than merely “informed consent” and “ethical approval”
- whether the researcher has described the relationship between the researcher and the informant and how this might have influenced data collection, e.g. a debt of gratitude, dependent relationship etc.

Determination of research paradigm qualitative research studies one (1) key question was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). All the interpretation was positive. (Table 4.1.4.1)

Table 4.1.4.1: Frequency table for determination of research paradigm

		Frequency	Percent	SD
Q1	yes	90	100.0	.000

The interpretation of the question, was relevant background literature reviewed? Gave positive response considering 10% expected count from each group. This value represents that, the research paradigm of the qualitative studies of MS degree under agricultural discipline were able to eradicate the limitations in their literature by expressing the aim of the research with appropriate manners.

Table 4.1.4.2: Interpretation of Q1: Was relevant background literature reviewed?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.5 Data collection and analysis

The way the data were collected and analyzed formed a set of issues to consider, again situated firmly within the qualitative paradigm. These were again broken down into a number of components, centering on issues of how, appropriateness and transparency. In terms of data collection and analysis, insight is needed not just into what methods were used and how, but also in the subsequent presentation of the data. Questions centered on what data were elicited, the interview guide/questionnaire used and the role that the researcher adopted within the study settings and ways that this might affect what was recorded and observed. Interest also lies on the researcher's reflexivity, providing insight into the relationship between the researcher, setting, data production and analysis.

Similarly, in the data analysis, focus lies on the evidence should be presented. For example, 'was negative and confirmatory evidence sought?', and 'how do the emerging findings cohere with other studies and theory?' Exactly what questions to ask depends on how the analysis was done. In some instances, the use of data from different sources might be of interest; in others, the use of iterative analysis; and in yet others the way the themes or categories emerged and the adequacy of their elaboration through the use of data extracts the following aspects should be considered:

- if the setting for data collection was justified.
- if the method used to collect the data is described (e.g., in-depth interview, semi-structured interview, focus group, observations, etc.).
- if the researcher has motivated the choice of data collection method.
- if it is explicitly disclosed how the selected method of data collection was undertaken (e.g., who conducted the interview, how long the interview took, whether a questionnaire was used, where the interview was conducted, how many observations were made, etc.).
- if the method was modified during the study (if so, is it described how and why this was done).
- if the collected data are clear (e.g., video or audio recording, notes, etc.)

- if the researcher has discussed whether saturation has been reached, i.e. when further data collection does not yield any new data (not always applicable).
- if an argument on saturation is applicable, consider whether it is reasonable, i.e., actually validated on good grounds.

Considering the analysis, the following aspects should be considered;

- if the analytical process is described in detail.
- if the analytical process is in accordance with any theoretical explanation or proposal on which the data collection was founded.
- if the analysis is based on a theme, is it described how this theme was arrived at?
- if tables have been used to clarify the analytical process.
- if the researcher has critically reviewed his own role, potential bias or influence on the analytical process.
- if there is saturation of analysis (is it possible to find more themes based on the citations presented?).

Determination of data collection qualitative research studies seven (7) key questions was selected from Spencer *et al.* (2003). For question 3 only 36.7% positive response were recorded against 63.3% negative outcome. And for question 5 28.9% response were negative. (Table 4.1.5.1)

Table 4.1.5.1: Frequency table for determination of data collection & analysis

		Frequency	Percent	SD
Q1	yes	90	100.0	.000
Q2	yes	90	100.0	.000
Q3	no	57	63.3	.485
	yes	33	36.7	.000
Q4	yes	90	100.0	.456
Q5	no	26	28.9	.000
	yes	64	71.1	.000
Q6	yes	90	100.0	.000
Q7	yes	90	100.0	.000
Q8	yes	90	100.0	.000

Comparing the studies, Data collection, sampling and analysis from MS research studies under agricultural Extension discipline. 6 out of 8 questions (Are the data collection methods clearly described? Were the appropriate data collected to address in the research? Has the detail and depth been demonstrated? Was population size justified? Was sample size justified? Do the collected data allow to address the research questions?) from every 10 groups gave positive outcome expressing the accuracy of the required criteria of a quality research. But for question 3 and 5 asking Has the diversity of perspective and content been explored? And are responses compared and contrasted across groups? Failed to outcome positive results as at least one study from every groups with 7 studies from group 1 (12.3% expected count) for question 4 and for group 1 and 10 4 studies (15.4% expected count) was failed to fulfill the criteria. Research studies under the group concerning farmers knowledge related literatures hurdles to explore the diversity of perspective and content. The Chi-square value of 4.833^a with the likelihood ratio of 4.891 suggested that $p < 0.05$ (it is now 0.04) and we reject the null hypothesis in favor of the alternative hypothesis. Where 10 cells (50.0%) have expected count less than 5. with the minimum expected count is

2.93 (Appendix III). Different methods are used to analyze qualitative data - the reader should be able to identify and describe the methods used in the study of interest, and make a judgement as to whether the methods are appropriate given the purpose of the study. Qualitative analyses are typically inductive i.e., starting with data and organizing them into “chunks” which are typically referred to as codes, categories and themes. Reviewers should be able to summarize the major findings of the analyses in this section. The codes, categories and/or themes developed by the researcher(s) should be logically consistent and reflective of the data. There should be an indication that the themes are inclusive of all data that exists, and data should be appropriately assigned to codes, categories, and aim of the research.

Table 4.1.5.2: Interpretation of Q1: Are the data collection methods clearly described?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.5.3: Interpretation of Q2: Were the appropriate data collected to address in the research?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.5.4: Interpretation of Q3: Has the diversity of perspective and content been explored?

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q3	no	Count	7	6	6	5	6	7	5	6	5	4	57
		% within q3	12.3%	10.5%	10.5%	8.8%	10.5%	12.3%	8.8%	10.5%	8.8%	7.0%	100.0%
	yes	Count	2	3	3	4	3	2	4	3	4	5	33
		% within q3	6.1%	9.1%	9.1%	12.1%	9.1%	6.1%	12.1%	9.1%	12.1%	15.2%	100.0%

Table 4.1.5.5: Interpretation of Q4: Has the detail and depth been demonstrated?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q4	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q4	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.5.6: Interpretation of Q5: Are responses compared and contrasted across groups?

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q5	no	Count	4	3	3	1	3	4	1	3	0	4	26
		% within q5	15.4%	11.5%	11.5%	3.8%	11.5%	15.4%	3.8%	11.5%	0.0%	15.4%	100.0%
	yes	Count	5	6	6	8	6	5	8	6	9	5	64
		% within q5	7.8%	9.4%	9.4%	12.5%	9.4%	7.8%	12.5%	9.4%	14.1%	7.8%	100.0%

Table 4.1.5.7: Interpretation of Q6: Was population size justified?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q6	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q6	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.5.8: Interpretation of Q7: Was sample size justified?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q7	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q7	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.5.9: Interpretation of Q8: Do the collected data allow to address the research questions?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q8	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q8	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.6 Researchers' Bias

There are many different types of biases described in the research literature. The most common ones that you should check for are described below under 3 main areas:

Sample (subject selection) biases,

which may result in the subjects in the sample being unrepresentative of the population which you are interested in;

Measurement (detection) biases,

which include issues related to how the outcome of interest was measured; and

Intervention (performance) biases,

which involve how the treatment itself was carried out.

- The researcher should direct to the bibliography if more detailed information is needed about biases.
- A bias affects the results of a study in one direction - it either “favours” the treatment group or the control group.
- It is important to be aware of which direction a bias may influence the results.

Determination of the researchers' bias of the qualitative research studies two (2) key questions was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). For Question 1 only 14.4% response were negative. (Table 4.1.6.1)

Table 4.1.6.1: Frequency table for determination of the researchers' bias

		Frequency	Percent	SD
Q1	no	13	14.4	.354
	yes	77	85.6	
Q2	no	90	100.0	.354

Comparing the studies researchers' bias from MS research studies under agricultural Extension discipline. 1 out of 2 questions (Are the researcher's own position, assumptions and possible biases outlined? (Indicate how those could affect the study, in particular, the analysis and interpretation of the data) and Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation?) from every 10 groups gave positive outcome expressing the accuracy of the required criteria of a quality research. But for question 1 asking how those could affect the study, in particular, the analysis and interpretation of the data, failed to outcome positive results as at least one study from every groups with 1 study from group 1 (23.1% expected count) was failed to fulfill the criteria. The Chi-square value of 7.035^a with the likelihood ratio of 8.931 suggested that $p < 0.05$ (it is now 0.04) and we reject the null hypothesis in favor of the alternative hypothesis. (Appendix VI). 10 cells (50.0%) have expected count less than 5. The minimum expected count is 1.16

Table 4.1.6.2: Interpretation of Q1: Are the researcher's own position, assumptions and possible biases outlined? (Indicate how those could affect the study, in particular, the analysis and interpretation of the data)

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	no	Count	3	2	2	1	1	0	2	1	0	1	13
		% within q1	23.1%	15.4%	15.4%	7.7%	7.7%	0.0%	15.4%	7.7%	0.0%	7.7%	100.0%
	yes	Count	6	7	7	8	8	9	7	8	9	8	77
		% within q1	7.8%	9.1%	9.1%	10.4%	10.4%	11.7%	9.1%	10.4%	11.7%	10.4%	100.0%

Table 4.1.6.3: Interpretation of Q2: Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation?

			Groups										Total	
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10		
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.7 Ethical Standard

To exploring the quality of MS research studies under agricultural extension discipline in Bangladesh it was considered that how clear and coherent is the reporting of ethics?

All qualitative research has ethical considerations and these should be considered within any research report. Ideally there should be a full discussion of ethics, although this is rare because of space limitations in peer-reviewed journals. If there are particularly fraught ethical issues raised by a particularly sensitive piece of research, then these should be discussed in enough detail that the researcher is convinced that every care was taken to protect research participants.

It was also considered if the role of the researcher clearly described?

The researcher should have considered their role in the research either as reader, interviewer, or observer for example. This is often referred to as 'reflexivity'. It is important that can be determined:

- A clear audit trail from respondent all the way through to reporting, why the author reported what they did report, and using that review can follow the reasoning from the data to the final analysis or theory.
- The 'status' of the researcher can profoundly affect the data, for example, a middle-aged woman and a young adult male are likely to get different responses to questions about 'Age'. If researcher interview a group of teenage boys, it is important to consider age, gender, ethnicity, 'insider' status. (for example, where the interviewer/researcher is part of the group being researched or has the same condition/illness).
- The researcher can also profoundly influence the data by use of questions, opinions and judgments, so it is important to know what the researchers' position is in that regard and how the researcher introduced and talked about the research with the participants.

Determination of ethical standard qualitative research studies four (4) key questions was selected from Spencer *et al.* (2003). Considering question 1 all the

response was negative, for question 2 only 36.7% response were positive but question 3 able to achieve 96.7% positive outcome. (Table 4.1.7.1). For the studies researchers' bias from MS research studies under agricultural Extension discipline. 1 out of 4 questions (Are the ethics of this discussed? Have ethical issues been adequately addressed? Have ethical issues been taken into consideration? Have the consequences of the research been considered i.e., raising expectations, changing behavior?) from every 10 groups gave positive outcome expressing the accuracy of the required criteria of a quality research. But for question 1 asking Are the ethics of this discussed? from every groups with all studies (10.0% expected count) were failed to fulfill the criteria. The Chi-square value of 4.306^a with the likelihood ratio of 4.279 suggested that $p < 0.05$ (it is now 0.04) and we reject the null hypothesis in favor of the alternative hypothesis. (Appendix VII). 10 cells (50.0%) have expected count less than 5. The minimum expected count is 2.93.

Table 4.1.7.1: Frequency table for determination of ethical standard qualitative research studies

		Frequency	Percent	SD
Q1	no	90	100.0	.000
Q2	no	57	63.3	.485
	yes	33	36.7	
Q3	no	3	3.3	.181
	yes	87	96.7	
Q4	yes	90	100.0	.000

Table 4.1.7.2: Interpretation of Q1: Are the ethics of this discussed?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	no	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.7.3: Interpretation of Q2: Have ethical issues been adequately addressed?

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	no	Count	7	4	6	4	6	6	6	6	6	6	57
		% within q2	12.3%	7.0%	10.5%	7.0%	10.5%	10.5%	10.5%	10.5%	10.5%	10.5%	100.0%
	yes	Count	2	5	3	5	3	3	3	3	3	3	33
		% within q2	6.1%	15.2%	9.1%	15.2%	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%	100.0%

Table 4.1.7.4: Interpretation of Q3: Have ethical issues been taken into consideration?

			Group										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
q3	no	Count	3	0	0	0	0	0	0	0	0	0	3
		% within q3	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	yes	Count	6	9	9	9	9	9	9	9	9	9	87
		% within q3	6.9%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	100.0%

Table 4.1.7.5: Interpretation of Q4: Have the consequences of the research been considered i.e., raising expectations, changing behavior?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q4	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q4	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

4.1.8 Rigor

Rigor in qualitative studies is critical. While in quantitative research one discusses concepts such as reliability and validity, qualitative researchers argue for the use of different terminology when determining the rigor of a qualitative study (Taylor, 2000). The overarching concept when considering rigor is;

- if there any evidence of trustworthiness? This requires that there be logical connections among the various steps in the research process from the purpose of the study through to the analyses and interpretation.
- if the researcher has critically reviewed his own role, potential bias or influence with respect to the analytical process.
- if the researcher has discussed the transferability of the results or other areas of application for the results.

Determination of rigor in qualitative research studies six (6) key questions was selected from Spencer *et al.* (2003). All six (6) question gave positive outcome. (Table 4.1.8.1)

Table 4.1.8.1: Frequency table for determination of rigor in qualitative research studies.

		Frequency	Percent	SD
Q1	yes	90	100.0	.000
Q2	yes	90	100.0	.000
Q3	yes	90	100.0	.000
Q4	yes	90	100.0	.000
Q5	yes	90	100.0	.000
Q6	yes	90	100.0	.000

The interpretation of the 6 questions, (Is the setting appropriate and/or sufficiently specific for examination of the research question? Is sufficient detail given about the setting? Is the design appropriate to the research question? Is a rationale given for using a qualitative approach? Are there clear accounts of the

rationale/justification for the sampling, data collection and data analysis techniques used? Is the selection of cases/sampling strategy theoretically justified?) Gave positive response considering 10.0% expected count from each group. This value represents that, the research rigor of the qualitative studies of MS degree under agricultural discipline were able to eradicate the limitations in their literature by expressing the required rigor of the research with appropriate manners.

Table 4.1.8.2: Interpretation of Q1: Is the setting appropriate and/or sufficiently specific for examination of the research question?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.8.3: Interpretation of Q2: Is sufficient detail given about the setting?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.8.4: Interpretation of Q3: Is the design appropriate to the research question?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q3	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q3	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.8.5: Interpretation of Q4: Is a rationale given for using a qualitative approach?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q4	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q4	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.8.6: Interpretation of Q5: Are there clear accounts of the rationale/justification for the sampling, data collection and data analysis techniques used?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q5	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q5	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.8.7: Interpretation of Q6: Is the selection of cases/sampling strategy theoretically justified?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q6	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q6	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

4.1.9 Reliability

Considerations in assessing the adequacy of research literature;

1. The clarity of writing;

- Consistency in use of terms?
- Are definitions provided where necessary?
- Are sentences well-constructed?
- Is there use of excessive rhetoric?

2. The problem or question being addressed;

- Is this clearly outlined?
- Is sufficient rationale provided for its significance?

3. The formulation of the main claims;

- Are these made clear?
- Are the relations between subordinate and superordinate claims (including evidence) made sufficiently explicit?
- Is the nature of each claim (as description, explanation, theory, evaluation, or prescription) indicated?

4. The formulation of the conclusions;

- Is there a distinction between main claims about the cases studied and general conclusions?
- Is the basis for the conclusions made signaled?

5. The account of the research process and of the researcher:

- Is there sufficient, and not too much, information about the research process?
- Is there sufficient, and not too much, information about the researcher? (In other words, is what is necessary and no more provided for assessing the validity of the findings, the value of the methods, the competence of the researcher, depending upon which is the focus.)

Determination of reliability in qualitative research studies five (5) key questions was selected from Spencer *et al.* (2003). For question 4 37.8% research literature failed to give positive outcome. (Table 4.1.9.1)

Table 4.1.9.1: Frequency table for determination of reliability in qualitative research studies

		Frequency	Percent	SD
Q1	yes	90	100.0	.000
Q2	yes	90	100.0	.000
Q3	yes	90	100.0	.000
Q4	no	34	37.8	.488
	yes	56	62.2	

For the studies reliability of MS research studies under agricultural Extension discipline. 3 out of 4 questions (Intervention was described in detail? Contamination was avoided? Cointervention was avoided? And Did more than 1 researcher theme and code transcripts/data?) from every 10 groups gave positive outcome expressing the accuracy of the required criteria of a quality research. But for question 1 asking Did more than 1 researcher theme and code transcripts/data? from every groups with at least 1 study were failed to fulfill the criteria with highest from group 5 (studies about project, training etc.) there 5 studies (expected count 14.7%) failed to fulfill the criteria. The Chi-square value of 5.105^a with the likelihood ratio of 5.579 suggested that $p < 0.05$ (it is now 0.04) and we reject the null hypothesis in favor of the alternative hypothesis. (Appendix VIII). 11 cells (55.0%) have expected count less than 5. The minimum expected count is 3.02.

Table 4.1.9.2: Interpretation of Q1: Intervention was described in detail?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.9.3: Interpretation of Q2: Contamination was avoided?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.9.4: Interpretation of Q3: Cointervention was avoided?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q3	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q3	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Table 4.1.9.5: Interpretation of Q4: Did more than 1 researcher theme and code transcripts/data?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q4	no	Count	4	4	3	3	5	3	4	4	1	3	34
		% within q4	11.8%	11.8%	8.8%	8.8%	14.7%	8.8%	11.8%	11.8%	2.9%	8.8%	100.0%
	yes	Count	5	5	6	6	4	6	5	5	8	6	56
		% within q4	8.9%	8.9%	10.7%	10.7%	7.1%	10.7%	8.9%	8.9%	14.3%	10.7%	100.0%

4.1.10 Credibility & trustworthiness

The components of credibility & trustworthiness are;

Assessing the validity of qualitative research is much more focused on demonstrating the causes of bias rather than eliminating them, as a result it is good practice to include sections in the report about the reflexive position of the researcher (what was their 'part' in the research?), about the context in which the research was conducted, and about the reliability of the data themselves;

1. Credibility which is related to the “true” picture of the phenomenon. Are descriptions and interpretations of the participants’ experiences recognizable?

Ways of ensuring credibility might include:

- collection of data over a prolonged period and from a range of participants;
- use of a variety of methods to gather data;
- use of reflective approach through keeping a journal of reflections, biases or preconceptions and ideas;
- triangulation, a strategy used to enhance trustworthiness through the use of multiple sources and perspectives to reduce systematic bias. Main types of triangulation are by sources (people, resources); by methods (interviews, observation, focus groups); by researchers (team of researchers versus single researcher) or by theories (team may bring different perspectives to research question for example a rehabilitation therapist and a sociologist); and the involvement of participants through member checking. Member checking may consist of the involvement of participants in a range of activities to verify data and interpretation such as returning transcriptions to participants for review of accuracy of the interview content or returning to participants at various stages during collection and analysis of data to ensure that the researcher reflects or presents the experience of the phenomenon as it is understood by the participants.

2. Transferability which is related to whether the findings can be transferred to other situations. Has the researcher described participants and the setting in

enough detail to allow for comparisons with your population of interest? Are there concepts developed that might apply to your clients and their contexts? Transferability is ensured through adequate descriptions of sample and setting.

3. Dependability which relates to the consistency between the data and the findings. There should be a clear explanation of the process of research including methods of data collection, analyses and interpretation often indicated by evidence of an audit trail or peer review. The audit trail describes the decision points made throughout the research process.

4. Confirmability which involves the strategies used to limit bias in the research, specifically the neutrality of the data not the researcher. This can be enhanced through the researcher being reflective and keeping a journal, peer review such as asking a colleague to audit the decision points throughout the process and checking with expert colleagues about ideas and interpretation of data, checking with participants about ideas and interpretation of data, and having a team of researchers.

To effectively use the tool, the appraiser requires knowledge, understanding and experience of the qualitative paradigm and, in particular, the problems and difficulties faced in undertaking qualitative research. It also requires knowledge of the qualitative paradigm and a constructive approach to critical appraisal, that is, not only pointing to weaknesses, but also strengths and ways that the quality of the study could be enhanced. We would recommend use of the tool in any context where the aim is either to develop qualitative (or other) research in a rigorous way and/or to promote and sustain reflexive practice in qualitative research. Use of such an evaluative tool should serve to enhance the contribution of qualitative research within evaluations of the effects of interventions (see, for example, the work of the Campbell Collaboration Methods Group 2001). More broadly, the availability and use of this tool should have an additional positive consequence of encouraging high standards for qualitative research. In particular, qualitative researchers must give greater insight into their methods, indicating the rigor and

systematic nature of the work. The pejorative description of qualitative research as ‘anecdote’ needs to be

replaced. Properly conducted qualitative studies provide valuable information in the search for effective practices. Sorting the ‘good’ from the ‘poor’ through use of a set of systematic and comprehensive methodological questions, grounded in the qualitative paradigm, becomes even more essential.

Determination of credibility & trustworthiness in qualitative research studies three (3) key questions was selected from Spencer *et al.* (2003). For all 90 research studies under the following study gave negative response against question 1. (Table 4.1.10.1)

Table 4.1.10.1: Frequency table for determination of credibility & trustworthiness in qualitative research studies

		Frequency	Percent	SD
Q1	no	90	100.0	.000
Q2	yes	90	100.0	.000
Q3	yes	90	100.0	.000

The interpretation of the 3 questions, (What were the total number of references used in the study? Are there any other noteworthy features of the study? Has the relationship between the researcher and the participants been adequately considered?) Gave positive response considering 10.0% expected count from each group form question 2 and 3 whereas, all studies gave negative response against question 1. This value represents that, the research credibility & trustworthiness of the qualitative studies of MS degree under agricultural discipline were able to eradicate the limitations in their literature by expressing the required credibility & trustworthiness of the research with appropriate manners.

Table 4.1.10.2: Interpretation of Q1: Were the sufficient number of references used in the study?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q1	no	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q1	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

Table 4.1.10.3: Interpretation of Q2: Are there any other noteworthy features of the study?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q2	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q2	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

Table 4.1.10.4: Interpretation of Q3: Has the relationship between the researcher and the participants been adequately considered?

			Groups										Total
			Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	
Q3	yes	Count	9	9	9	9	9	9	9	9	9	9	90
		% within q3	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This Chapter compiles with the data that is collected by reviewing the MS research studies under agricultural discipline of Bangladesh and have been coded, treated, tabulated and statistically analyzed according to the objectives of the study, which is thoroughly called summary and conclusion.

5.1 Summary of the Findings

5.1.1 Selected characteristics of the study

Validity of findings

Measurement of the validity of the finding(s) of any qualitative research studies answer of some key questions must be present. The evaluation tools developed by Andrew Long and Godfrey (2004) with the title ‘An evaluation tool to assess the quality of qualitative research studies’, published in ‘International Journal of Social Research Methodology Theory and Practice’ was considered as standard here and 5 key closed form question was selected. Only for the question 4 30% of the time the output was negative.

Aim of the research

Determination of the aim of the qualitative research studies two (2) key questions was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). All the question response positively.

Methodology

Accuracy in methodology in any qualitative research is difficult to identify rather identifying which type of methodology used was considered in the following study. Five (5) key question was selected to evaluate the methodological criteria from Hong *et al.* (2018). Only for the question 4 24.4% of the response were negative.

Research paradigm

Determination of research paradigm qualitative research studies one (1) key question was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). All the interpretation was positive.

Data collection and analysis

Determination of data collection qualitative research studies seven (7) key questions was selected from Spencer *et al.* (2003). For question 3 only 36.7% positive response were recorded against 63.3% negative outcome. And for question 5 28.9% response were negative.

Researchers' bias

Determination of the researchers' bias of the qualitative research studies two (2) key questions was selected from the evaluation tools developed by Andrew Long and Godfrey (2004). For Question 1 only 14.4% response were negative.

Ethical standard

Determination of ethical standard qualitative research studies four (4) key questions was selected from Spencer *et al.* (2003). Considering question 1 all the response was negative, for question 2 only 36.7% response were positive but question 3 able to achieve 96.7% positive outcome.

Rigor

Determination of rigor in qualitative research studies six (6) key questions was selected from Spencer *et al.* (2003). All six (6) question gave positive outcome.

Reliability

Determination of reliability in qualitative research studies five (5) key questions was selected from Spencer *et al.* (2003). For question 4 37.8% research literature failed to give positive outcome.

Credibility & trustworthiness

Determination of credibility & trustworthiness in qualitative research studies three (3) key questions was selected from Spencer *et al.* (2003). For all 90 research studies under the following study gave negative response against question 1.

5.2. Conclusion

Quality assessment of MS research studies remains an unexplored area. While considerable widespread debate continues around the feasibility and utility of the assessment and selection of any well-constructed evaluation tool, it is very difficult to make recommendations within the specific context of informing, enhancing and extending as a review. In assessing the quality of an original study, it was focused on quality of reporting in the corresponded literature, methodological rigor and conceptual depth of MS research studies and applicability of its findings. In the following study most of the criteria was fulfilled as a whole by the selected MS researches under agricultural extension discipline except the researcher bias and ethical standard of the researcher literature

5.3 Recommendations:

- Details study is necessary to select an evaluation tool for quality assessment of any MS researches under agricultural extension discipline.
- It is difficult to simply accept the existing array of qualitative approaches, that there is a need to develop common ground.
- In relation to assessing MS researches under agricultural extension discipline it is identified that, some quite different forms of assessment and it can be argued that some MS researches under agriculture extension discipline involve diverse requirements.
- There is a tendency sometimes to assume that reviewers of the selected studied should do this in the same way as researchers. In fairly abstract

terms this is perhaps true, but they too will need to make judgements on the basis of plausibility and credibility.

- Any comprehensive list is likely to be very long (in assessing the validity of findings, also need to evaluate the methods used, and to some degree even the competence of the researcher) and, the criteria can serve as little more than reminders, they cannot be transparent. In the sense of being applicable with equal effectiveness by anyone it is necessary to reliance on background knowledge and expert assessment.

5.4 Recommendation for further studies

- There is clear and definitive demand for an evaluation tool for quality assessment of any MS researches studies likely to be added by particular pieces or from a conception of research funding.
- Further study should be conducted with other MS researches under agriculture discipline taken under consideration.
- It is also recommended that future studies should be included more reliable measurement of concerned variable.

References

- Atkinson, B., Heath, A., & Chenail, R. (1991). Qualitative research and the legitimization of knowledge. *J. of Marital and Family Ther.* 17. 175-180.
- BARC, (2012). Bangladesh NARS-2030- A Vision for Agricultural Research.
- Bogdan, R.C., & Biklen, S.K. (1982). *Qualitative research for education: An introduction to theory and methods.* Boston: Allyn and Bacon.
- Boulton, M., Fitzpatrick, R. and Swinburn, C. (1996) Qualitative research in health care: II A structured review and evaluation of studies. *J. of Evalu in Clin Prac.* 2. 171–179.
- Bryman, A. (1988) *Quantity and Quality of Social Research* (London: Unwin Hyman).
- Brinberg, David and D. Cook, Thomas & Reichardt, Charles. (1981). Qualitative and Quantitative Methods in Evaluation Research. *Educational Researcher.* 10. 10.2307/1174260.
- Burns, N. and Grove, S.K. (2005). *The Practice of Nursing Research: Conduct, Critique and Utilization.* 5th Edition, Elsevier Saunders, Missouri.
- Carboni, J. (1995). A Rogerian process of inquiry. *Nursing Sci. Quarl.* 8. 22-37.
- Carcary, M. (2009). The Research Audit Trial – Enhancing Trustworthiness in Qualitative Inquiry. *The Elec J. of Busi Rech Meth.* 7 (1). (pp.11 - 24).
- Clandinin, D.J., and Connelly, F.M. (1994). Personal experience methods. In N. K. Denzin & Y. S. Lincoln (Eds), *Handbook of qualitative research* (pp. 413-427). London: Sage.
- Cohen, D.J. and Crabtree, B.F. (2008). Evaluative criteria for qualitative research in health care; controversies and recommendations. *Annals of Fam. Med.* 6 (4). 331-39.
- Creswell, W. John and Clark, L.P. (2011). Designing and Conducting Mixed Method Research. *J. of Agril Edu.* 38(3). 38-45.
- Davies, H.T.O., Nutley, S. and Smith, P.C. (2000). *What Works? Evidence-based Policy and Practice in Public Services* (eds) (Bristol: Policy Press).
- Denzin, N.K. (1994). The art and politics of interpretation. In N.K. Denzin and Y.S. Lincoln (eds) *Handbook of Qualitative Research.* London. Sage. pp. 500–515.

- Dooley, L.M. (2002). Case study research and theory building. *Advances in Developing Human Resources*. 4(3). 335- 354.
- Eden, L. (2004). Making an impact: Building a research program and getting published. Presentation at Doctoral Student Consortium. New Orleans: Academy of Management meetings, International Management Division.
- Fitzpatrick, R. and Boulton, M. (1994). Qualitative methods for assessing health care. *Quality in Health Care*. 3. 107–113.
- Glaser, B.G. and A.L. Strauss. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- George, M, Apter, A.J. (2004). Gaining insight into patients' beliefs using qualitative research methodologies. *Curr Opin Allergy Clin Immunol*. 4(3). 185-9.
- Guba, E.G., and Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative rech.* (pp. 105–117). Thousand Oaks, CA: Sage.
- Geuna, Aldo and Piolatto, Matteo, (2015). Research Assessment in the UK and Italy: Costly and Difficult, But Probably Worth. SWPS 2015-27.
- Gomez, K. A. and Gomez, A. A. (1984). *Statistical Procedure for Agricultural Res.* (2nd Ed.) John Wiley and Son. Singapore., pp. 188-192.
- Grossoehme D.H. (2014). Overview of qualitative research. *J. of healt care chapncy*, 20(3). 109-22.
- Hammersley, M. (1987). 'Some Notes on the Terms "Validity" and "Reliability"'. *British Edu Rech J.* 13. 1. pp 73-81.
- Hammersley, M. (2001). On ‘systematic’ reviews of research literatures: a ‘narrative’ response to Evans & Benefield. *British Edu Rech J.* 27. 543–554.
- Harden A. (2008). Critical Appraisal and Qualitative Research: Exploring sensitivity analysis. ESRC Research Methods Festival, St. Catherine’s College Oxford, 30th June-3rd July,
- Hill A. and Spittlehouse C. (2003). What is critical appraisal? *Evidence-Based Medicine*; 3(2). 1-8.
- Houghton, Catherine and Casey, Dympna and Shaw, David and Murphy, Kathy. (2013). Rigor in qualitative case-study research. *Nurse recher.* 20. 12-7.

- Holstein, J.A. and Gubrium, J.F. (1994). Phenomenology, ethnomethodology, and interpretive practice. In N. K. Denzin, & Y. S. Lincoln, (eds.) Thousand Oaks, CA. Sage. *Handbook of Qualitative Rech.* pp. 262-272.
- Johnson, P., Buehring, A., Cassell, C., & Symon, G. (2006). Evaluating qualitative research: Towards a contingent criteriology. *Inter J. of Manged Reviews*, **8**(3), 131–156.
- Klopper, H. (2008). The qualitative research proposal. *Curationis*, **31**(4).
- Klopper, H.C. and Knobloch, S (2008). Validity, reliability, and trustworthiness (Submitted manuscript). pp. 1-18.
- Lincon, Y.S. and Guba, E.G. (1985). *Naturalistic Inquiry*. London: Sage.
- Lofland, J. and Lofland, L.H. (1971) *Analyzing Social Settings* (Belmont, CA: Wadsworth).
- Maxwell, J.A. (2013). *Qualitative research design: An interactive approach*. Thousand Oaks, CA. Sage.
- Merriam, S.B. (1998). *Qualitative research and case study applications in education*. San Francisco (USA): Jossey-Bass. p. 179.
- Miles, M.B. and Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks. CA. Sage Publications, Inc.
- Morse, M. and Field, A. (1995). *Qualitative Research Methods for Health Professionals*. Sage Publications, Thousand Oaks.
- Mouton, J. and Marais, H.C. (1996). *Basic concepts in the methodology of the social sciences*. HSRC Series in Methodology. Pretoria. HSCR Printers.
- Mouton, J. (1996). *Understanding Social Research*. Pretoria. JL Van Schaik.
- Morse, J.M. Barrett, M. Mayan, M. Olson, K. and Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *Intel J. of Quali Methods*. 1. 1-19.
- Murphy, E. Dingwall, R. Greatbatch, D. Parker, S. and Watson P. (1998). Qualitative research methods in health technology assessment: a review of the literature. *Health Technol. Assess.* 2. 1–276.
- Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA. Sage.
- Micah, A. and Gary, K. (2007). A proposed standard for the scholarly citation of quantitative data. *D-lib Mag.* 13.

- McNay, Ian. (2016). Imbalancing the Academy: the impact of research quality assessment. *Sociologia Italiana AIS J. of Sociol.* 5. 3-7
- Neave, Guy. (2019). The Universities' responsibilities to society: international perspectives. *Sociologia Italiana AIS J. of Sociol.* 5. 8-13
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (Eds) Sage Publications, London, UK. 3.
- Popay, J. and Williams, G. (1998). Qualitative research and evidence-based healthcare. *J. of the Royal Soci. of Med.* 901. Supplement 35. 32–37.
- Popay, J., Rogers, A. and Williams, G. (1998). Rationale and standards for the systematic review of qualitative literature in health services research. *Quali. Health Rech.* 8. 341–351.
- Polit, D.F. and Beck, C.T. (2012). *Nursing Research: Generating and Assessing Evidence for Nursing Practice.* 9th Edition, Lippincott, Williams & Wilkins, Philadelphia.
- Sandelowski, M. (1986). The problem of rigor in qualitative research. *ANS Adv. in Nursing Sci.* 8. 27–37.
- Sandelowski, M. and Barroso, J. (2002). Reading qualitative studies. *Interl J. of Quali. Meths.* 1 (1). 5.
- Sandelowski, M. and Thorne, S. (2008). *Interpretative description.* Walnut Creek (US). The Left Coast Press. p.11-4.
- Sliep, Y. Poggenpoel, M. and Gmeiner, A.C. (2001). A care counselling model for HIV reactive patients in rural Malawi. *Curationis.* 24 (3). 66-74.
- Strauss, A. and J. (1990). Corbin. *Basics of qualitative research: Grounded theory procedures and techniques.* Newbury Park: Sage,
- Stake, R. (1995). *The Art of Case Study Research.* Thousand Oaks, CA. Sage.
- Stake, R.E. (1994). Case Studies. In: Denzin, N.K. and Lincoln, Y.S., Eds., *Handbook of Qualitative Research.* Sage. Thousand Oaks. 236-247.
- Temple, B. (1998). A fair trial? Judging quality in qualitative research. *Intern J. of Soci. Rech Methodol.* 1. 205–215.
- Warmbrod, J.R. (1987). Research in agricultural education: Requisites for further progress. Proceedings of the 41st Central States Agricultural Education Research Conference.

Whyte, W.F. (1997). *Creative Problem Solving in the Field: Reflection as a Career*. Walnut Creek. Altamira Press.

Williams, D.L. (1997). Focusing agricultural education research: An agenda for the graduate student. *J. of Agril Edu.* **38**(3). 28-35.

Appendix I

Department of Agricultural Extension & Information System

Sher-e-Bangla Agricultural University Bangladesh

An evaluation tools for a research study entitled

Use of Evaluation Tools to Assess the Quality of MS Research Studies under Agricultural Extension Discipline in Bangladesh

Serial No.:

Review Area	Key Questions	Responses
Bibliographic Details	Title	
	Author	
	Source	
	Year	

Study overview:

Literature Overview:

1. Validity of the finding(s)

Quality criteria	Responses	
	Yes	No
Q1. Were the outcome measures valid?		
Q2. Were the outcome measures reliable?		
Q3. Were outcome criteria are used in the study valid?		
Q4. Is there sufficient breadth (e.g. contrast of two or more perspective) and depth (e.g. insight into a single perspective)?		
Q5. Are the findings clearly presented?		

(Long and Godfrey, 2004)

2. Aim of the Research

Quality criteria	Responses	
	Yes	No
Q1. Are the findings relevant to the aims of the study?		
Q2. Was the purpose stated clearly?		

(Long and Godfrey, 2004)

3. Methodology of Qualitative research

Quality criteria	Responses	
	Yes	No
Q1. Is the sampling strategy relevant to address the research question?		
Q2. Is the sample representative of the target population?		
Q3. Are the measurements appropriate?		
Q4. Is the risk of nonresponse bias low?		
Q5. Is the statistical analysis appropriate to answer the research question?		

(Hong *et al.*, 2018)

4. Research paradigm

Q1. Was relevant background literature reviewed?

- Yes.....
- No.....

(Long and Godfrey, 2004)

5. Data collection/Sampling Analysis

Quality criteria	Responses	
	Yes	No
Q1. Are the data collection methods clearly described?		
Q2. Were the appropriate data collected to address in the research?		
Q3. Has the diversity of perspective and content been explored?		

Q4. Has the detail and depth been demonstrated?		
Q5. Are responses compared and contrasted across groups?		
Q6. Was population size justified?		
Q7. Was sample size justified?		
Q8. Do the collected data allow to address the research questions?		

(Spencer *et al.*, 2003)

6. Researchers' Bias

Quality criteria	Responses	
	Yes	No
Q1. Are the researcher's own position, assumptions and possible biases outlined? (Indicate how those could affect the study, in particular, the analysis and interpretation of the data)		
Q2. Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation?		

(Long and Godfrey, 2004)

7. Ethical standard

Quality criteria	Responses	
	Yes	No
Q1. Are the ethics of this discussed?		
Q2. Have ethical issues been adequately addressed?		
Q3. Have ethical issues been taken into consideration?		
Q4. Have the consequences of the research been considered i.e. raising expectations, changing behavior?		

(Spencer *et al.*, 2003)

8. Rigor

Quality criteria	Responses	
	Yes	No
Q1. Is the setting appropriate and/or sufficiently		

specific for examination of the research question?		
Q2. Is sufficient detail given about the setting?		
Q3. Is the design appropriate to the research question?		
Q4. Is a rationale given for using a qualitative approach?		
Q5. Are there clear accounts of the rationale/justification for the sampling, data collection and data analysis techniques used?		
Q6. Is the selection of cases/sampling strategy theoretically justified?		

(Spencer *et al.*, 2003)

9. Reliability

Quality criteria	Responses	
	Yes	No
Q1. Intervention was described in detail?		
Q2. Contamination was avoided?		
Q3. Cointervention was avoided?		
Q4. Did more than 1 researcher theme and code transcripts/data?		

(Spencer *et al.*, 2003)

10. Credibility & trustworthiness

Quality criteria	Responses	
	Yes	No
Q1. Were the sufficient number of references used in the study?		
Q2. Are there any other noteworthy features of the study?		
Q3. Has the relationship between the researcher and the participants been adequately considered?		

(Spencer *et al.*, 2003)

Appendix II: Justification of the evaluation tools.

A. Validity of the findings:

Q1. Were the outcome measures valid? - The outcome is usually stated briefly in the abstract of the article, and again in more detail in the introduction. It may be phrased as a research question.

Q2. Were the outcome measures reliable? - For future reference, it is useful to provide a summary of the purpose or research question, so that someone else can quickly get a sense of the article.

Q3. Were outcome criteria are used in the study valid? - A clear statement of purpose helps to determine if the topic is important, relevant.

Q4. Is there sufficient breadth (e.g. contrast of two or more perspective) and depth (e.g. insight into a single perspective)? - It identifies gaps in current knowledge and research about the topic of interest, and thus justifies the need for the study being reported.

Q5. Are the findings clearly presented? - The justification for the study should be clear and compelling. Readers should be able to understand the researchers' thinking in conducting the study. (Long and Gdfrey, 2004)

B. Aim of the research:

Q1. Are the findings relevant to the aims of the study? - The depth of understanding and description required from participants i.e., qualitative research usually involves the exploration of a topic or issue in depth, with emphasis on seeking information from the people.

Q2. Was the purpose stated clearly? - the qualitative research is seeking meaning and understanding, which is best described clearly in narrative form. (Long and Gdfrey, 2004)

C. Methodology of qualitative research

Q1. Is the sampling strategy relevant to address the research question? - Qualitative interviews place an emphasis on listening and following the direction

of the participant/informant. A variety of open-ended and coded questions are chosen to elicit the most information possible in the time available.

Q2. Is the sample representative of the target population? - Sample chosen by the researcher must of the research viewpoint, status in a group, culture or organization.

Q3. Are the measurements appropriate? - Frequently, the interview protocol provides opportunities for the interviewer to probe following participant responses to open-ended questions.

Q4. Is the risk of nonresponse bias low? - The drawback to interviewing is related to the constraints imposed by language. The types of questions asked will frame the participants' responses, and this should be taken into account by the researcher

Q5. Is the statistical analysis appropriate to answer the research question? – There should be an indication that the themes are inclusive of all data that exists, and data analysis should be appropriately assigned to codes, categories, and research questions. (Hong *et al.*, 2018)

D. Research paradigm:

Q1. Was relevant background literature reviewed? - A review of the literature should be included in an article describing research to provide some background to the study. It should provide a synthesis of relevant information such as previous work/research, and discussion of the real-world importance of the topic. (Long and Gdfrey, 2004)

E. Data collection, Sampling and Analysis:

Q1. Are the data collection methods clearly described? - This requires a clear and vivid description of the important elements of the study that are connected with the data, namely the participants, and the site or setting.

Q2. Were the appropriate data collected to address in the research? - This requires a clear and vivid description of the important elements of the study that are connected with the data collection.

Q3. Has the diversity of perspective and content been explored? - it is need to clarify what contribution each participant made to the data gathering, analysis, and interpretation of the findings.

Q4. Has the detail and depth been demonstrated? - This requires a clear and vivid description of the important elements of the study that are connected with the data, namely the participants, and the site or setting.

Q5. Are responses compared and contrasted across groups? - The unique characteristics of key informants help to explain why they were selected. The credibility of the informants should be explored.

Q6. Was population size justified? - it is need to clarify what contribution each participant made to the data gathering.

Q7. Was sample size justified? - it is need to clarify what contribution each participant made to the data gathering.

Q8. Do the collected data allow to address the research questions? - A vivid but concise description of the participants, site and researcher should provide the reader with an understanding of the 'whole picture' of the topic or phenomenon of interest. (Spencer *et al.*, 2003)

F. Researchers' Bias

Q1. Are the researcher's own position, assumptions and possible biases outlined? - Indicate how those could affect the study, in particular, the analysis and interpretation of the data.

Q2. Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation? - A bias affects the results of a study in one direction - it either "favors" the sample or the focused group. It is important to be aware of which direction a bias may influence the results. (Long and Gdfrey, 2004)

G. Ethical Standard:

Q1. Are the ethics of this discussed? - The researcher can also profoundly influence the data by use of questions, opinions and judgments, so it is important to know what the researchers' position is in that regard and how the researcher introduced and talked about the research with the participants.

Q2. Have ethical issues been adequately addressed? - The researcher can also profoundly influence the data by use of questions, opinions and judgments, so it is important to know what the researchers' position is in that regard and how the researcher introduced and talked about the research with the participants.

Q3. Have ethical issues been taken into consideration? - The researcher should have considered their role in the research either as reader, interviewer, or observer for example. This is often referred to as 'reflexivity'.

Q4. Have the consequences of the research been considered i.e. raising expectations, changing behavior? - The researcher should have considered their role in the research either as reader, interviewer, or observer for example. This is often referred to as 'reflexivity'. (Spencer *et al.*, 2003)

H. Rigor:

Q1. Is the setting appropriate and/or sufficiently specific for examination of the research question? - This requires that there be logical connections among the various steps in the research process from the purpose of the study through to the analyses and interpretation.

Q2. Is sufficient detail given about the setting? - This requires that there be logical connections among the various steps in the research process from the purpose of the study through to the analyses and interpretation.

Q3. Is the design appropriate to the research question? - This requires that there be logical connections among the various steps in the research process from the purpose of the study through to the analyses and interpretation.

Q4. Is a rationale given for using a qualitative approach? - If the researcher has critically reviewed his own role, potential bias or influence with respect to the analytical process.

Q5. Are there clear accounts of the rationale/justification for the sampling, data collection and data analysis techniques used? - If the researcher has critically reviewed his own role, potential bias or influence with respect to the analytical process.

Q6. Is the selection of cases/sampling strategy theoretically justified? - If the researcher has discussed the transferability of the results or other areas of application for the results. (Spencer *et al.*, 2003)

I. Reliability:

Q1. Intervention was described in detail? - Definitions provided in the literature should sufficient.

Q2. Contamination was avoided? - Contamination of data and review should be avoided.

Q3. Cointervention was avoided? - Sufficient rationale should be provided for its significance.

Q4. Did more than 1 researcher theme and code transcripts/data? - what is necessary and no more provided for assessing the validity of the findings, the value of the methods, the competence of the researcher, depending upon which is the focus. (Spencer *et al.*, 2003)

J. Credibility and Trustworthiness:

Q1. Were the sufficient number of references used in the study? – Higher the number of references used in the study is better.

Q2. Are there any other noteworthy features of the study? - The researcher described participants and the setting in enough detail to allow for comparisons with the population of interest.

Q3. Has the relationship between the researcher and the participants been adequately considered? - Descriptions and interpretations of the participants' experiences should recognizable. (Spencer *et al.*, 2003)

Appendix III. Chi-Square Test of Data collection, Sampling and Analysis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.833 ^a	9	.849
Likelihood Ratio	4.891	9	.844
Linear-by-Linear Association	1.452	1	.228
N of Valid Cases	90		
a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is 2.93.			

Appendix IV. Chi-Square Test of Validity of the findings.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.288 ^a	9	.986
Likelihood Ratio	2.277	9	.986
Linear-by-Linear Association	1.045	1	.307
N of Valid Cases	90		
a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is 2.40.			

Appendix V. Chi-Square Test of Methodology.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.836 ^a	9	.756
Likelihood Ratio	5.993	9	.741
Linear-by-Linear Association	3.123	1	.077
N of Valid Cases	90		
a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is 1.96.			

Appendix VI. Chi-Square Test of Researchers' bias.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.035 ^a	9	.633
Likelihood Ratio	8.931	9	.444
Linear-by-Linear Association	3.264	1	.071
N of Valid Cases	90		
a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is 1.16			

Appendix VII. Chi-Square Test of Ethics.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.306 ^a	9	.890
Likelihood Ratio	4.279	9	.892
Linear-by-Linear Association	.217	1	.641
N of Valid Cases	90		
a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is 2.93.			

Appendix VIII. Chi-Square Test of Reliability.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.105 ^a	9	.825
Likelihood Ratio	5.579	9	.781
Linear-by-Linear Association	.769	1	.380
N of Valid Cases	90		
a. 11 cells (55.0%) have expected count less than 5. The minimum expected count is 3.02.			