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RESEARCH DATA COLLECTION

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ABSTRACT

This research examines data collection methods in quantitative and qualitative approaches, with a focus on in-depth understanding of the data collection, analysis and validation processes. The main objective of this study is to increase understanding of effective data collection techniques and identify methods that can increase the validity and reliability of research data. The methodology applied is a literature study, which involves theoretical analysis of data collection techniques, research instruments, and data validity. The research results show significant differences in data collection methods between quantitative and qualitative research, each with its advantages and disadvantages. The study's conclusion emphasizes the importance of selecting appropriate data collection methods to ensure data validity, which is crucial for analysis in follow-up studies.

INTRODUCTION

In the research methodology, data collection is a series of procedures that are urgent in taking systematic steps. The data collection process will certainly involve research objects, research subjects, research instruments, and data collection techniques.

Data collection techniques are the way researchers take to obtain information or research data, and are also a strategic step in research methodology. In order to use research techniques and instruments better, it is necessary to pay attention to data collection steps such as:1 identification of informants and research locations, ease of access to individuals and the community by bringing permits, determination of information types to obtain saturated data, stimulation of instrumental research protocols and tools, and administration of research data that has been obtained.

The validity of the data ensures that the results of the study accurately reflect the phenomena being studied, reduce bias, support the generalization of results, facilitate informed decision-making, and improve scientific integrity. Validity analysis is essential to maintain credibility and reliability, validity in research.

METHODS

In this study, the author uses a library research method. Literature research is research that is carried out using literature in the form of books, notes, journals, etc. Literature research is a method of

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collecting data by reviewing books, journals, and previous research that are relevant to the problem to be researched. In the search for theories, researchers collect as much information as possible from related literature. After obtaining relevant literature, the researcher immediately compiles it in an orderly manner to be used in research. Therefore, literature research includes general processes such as systematically identifying theories, finding literature, and analyzing documents that contain information related to the research topic.

RESULTS

Data Collection Techniques

In general, the researcher carries out data collection to obtain and collect information based on the supporting facts that exist in the research site and the technique chosen is highly determined by the research methodology chosen by the researcher. Because the quality of research is highly determined by the accuracy of the use of data collection techniques, researchers must really understand and master data collection techniques. The right technique determines the validity of the data obtained.

In data collection techniques, of course, there is a process that must be carried out. In order for the collected data to be validated, the process must be carried out systematically and purposefully. This is because basically the data collection process in this data collection technique must later be able to prove the hypothesis of the data that has been collected by the researcher. The data collection process includes:

1. Review the literature and consult with an expert

The initial stage in collecting data is to collect various information related to research problems. This data was obtained through literature review and consultation with experts, so that researchers fully understand the relevant issues, concepts, and variables in the study

2. Approach to community groups

The second stage is that the researcher must study and approach community groups which then the research can be accepted and also related to the figures concerned.

3. Build good relationships with respondents

Next is to build relationships with respondents and their environment. This includes studying respondents' habits, how they think, act, and use language, among other things, to support the continuity of the research.

4. Trial or pilot study

Furthermore, the research instrument should be tested on community groups that are part of the population, not samples. The goal is to determine if the instrument used is well understood, easy to use, communicative, and so on.

5. Formulate and structure questions

Furthermore, the instruments that have been collected are compiled into questions relevant to the research objectives. The question must have a substantive and significant meaning.

6. Recording and coding

After the research instrument is prepared, the data needed from each respondent is recorded. This various information obtained needs to be recorded to facilitate the analysis process.

7. Cross checking, validity, and reliability

After that, a cross-checking method is carried out on the data obtained to re-test its correctness and check so that there is no doubt about its validity and reliability.

8. Data organization and recoding

Finally, after the data is collected, the author must coordinate the various data that has been collected, and the author can start analyzing the data so that there is no less valid data.

In research, of course, it is not unfamiliar with the terms data collection methods and data collection instruments. These two terms have different meanings, although they are interconnected. The data collection method is the way researchers collect data to obtain the information needed to achieve the research objectives. Data collection instruments are tools used to collect data. Data collection instruments can be checklists, questionnaires, interviews, and even cameras to record images or take photos. In research, there are many different data collection methods that can be used. These methods can be used separately, but they can also be used by combining two or more methods.

The data collected in the study can be divided into several categories based on their characteristics:

a. Quantitative and Qualitative Data: Quantitative data is data that is expressed in the form of numbers, while qualitative data is expressed in the form of narratives or images.
b. Primary and Secondary Data: Primary data is data collected directly by researchers for specific research purposes. Secondary data is data that already exists, which is collected for other purposes but used by researchers for further analysis.
c. Internal and External Data: Internal data comes from within the organization, such as financial statements or operational data. External data, on the other hand, comes from outside the organization, such as government data or industry data.
d. Time Series and Cross-Sectional Data: Time series data is data collected over a specific period of time, allowing for trend analysis. Cross-sectional data is collected at a single point in time, reflecting the conditions at that time

Some of these data collection methods/techniques include:

Interview

Interview is a data collection technique that involves direct interaction between researchers and research participants, in other words, interview is a data collection technique that is carried out through face-to-face and direct question and answer between researchers and resource persons (Berg, 2020; Rubin & Rubin, 2011). The interview aims to gain an in-depth understanding of the individual's experiences, views, and perspectives regarding the phenomenon being studied. Interviews can be conducted in a structured, semi-structured, or unstructured manner, depending on a predetermined level of skeletal (Creswell, 2014). Along with the development of technology, interview methods can also be carried out through certain media, such as telephone, email, or video call via Zoom or skype. According to experts, interviews are divided into several categories, namely structured, semi-structured and unstructured interviews, open ended, open standard. Judging from the subject of the research or participants, namely one-on-one interviews and focus group interviews and seen from the aspect where the interviews are divided into two, namely onsite interviews and offsite interviews, the following is the explanation:

a. Structured interviews

Structured interview is an interview technique used by researchers by asking several questions to participants based on interview guidelines with limited answer categories. In this technique, the researcher limits the variety of respondents' answers because they have estimated the respondents' answers. This technique is usually used by researchers in data collection because they know the certainty of the data that will be obtained at the research site.

b. Semi-Structured Interview

Semi-structured interview is an interview technique with the researcher giving a series of questions to the respondent where the respondent is given a little space to vary his answer in the form

of ideas and opinions. In this technique the researcher must be a good listener while taking notes on the participant's station.

c. Unstructured interviews

Unstructured interviews are free, open, and informal interview techniques that do not use a question sheet but rather an outline of research variables. This interview technique was used by the researcher in the preliminary study to obtain preliminary data from the research location. The advantage of using this interview technique is that the conversation is spontaneous and the problems that arise are unlimited.

d. Open Interview

An open interview is an interview conducted with respondents who know and are aware of themselves as the subject of the research and know the purpose of the interview.

e. Open Standard Interview

An open-ended standard interview is in which the researcher creates standard questions to extract information from the informant with the same order of words, sentences and diction for all respondents involved.

f. One-on-One Interview

One-on-one interviews are individual interviews that are conducted alternately with participants so that it takes more time. Ideally, these interviews are used on articulate high-performance participants who can share information.

g. Interview of the Pokus Group

Focus group interviews, also called FGD (focus group discution), are interview models by presenting several participants as small groups to be asked for their responses from common questions given by the researcher so as to obtain the best information.

h. Onsite Interviews

Onsite interview is a direct contact interview technique of the researcher with the participant at the same time and place by involving the conditions and situations directly.

i. Offsite Interviews

Offsite interviews are interview techniques between researchers and participants that are not in one place but at the same time and do not have direct contact such as interviews via phone, and via social media chat or email.

As for the type of interview questions, there are several aspects that are often asked of respondents such as experience, opinions, feelings, knowledge, capture of the five senses, demographics, hypotheses, idealism, interpretation, suggestions, arguments, beliefs and directions. According to Spradley, states that there are three types of interviews, namely descriptive, structural, and contrast. And no less important associative questions. Here's the explanation:

a. Descriptive questions, are types of questions that ask respondents to describe their experiences, opinions, knowledge, etc.
b. Structural questions are a type of question that asks respondents to form and organize their experiences, opinions, knowledge, etc.
c. Constructive or comparative questions are types of questions that ask respondents to be able to differentiate aspects of experience, opinions, knowledge, etc.
d. Associative questions are a type of question that asks respondents to relate experiences, opinions, knowledge, etc.

As for the general steps of the interview, they are:

a. Identify participants as a place to ask questions.

b. Determining the type of interview to be used
c. Prepare a recording device and recorder that can store various information.
d. Contact Participants that will Interviewed to obtain their approval so that they can determine the place and time of the interview.
e. Take short notes during the interview process
f. Prepare an alternative plan in anticipation of failing to conduct an interview for a specific reason

Observation

Observation is the main basis of all disciplines. Every discipline is faced with the reality of objects that can be observed as material for study and research. Observation is a sensory activity based on observation of the behavior of the research subject in the accompanying social conditions.18 Observation is the most familiar type of data collection in research activities, it is an effective way to collect a lot of information. According to Creswell, observation is a data collection technique by observing and seeing directly the events from the behavior of the research subject or the situation at the place where the event occurred.

Observation only collects data through the senses of the eyes, not that actually all five senses can be involved in the form of taste and touch. So observation can collect impressions by using the absorption of all five senses even though it is through a long distance by recording using media. And the main principle of observation is not to intervene (non-intervisionism) that has the effect of manipulating and stimulating the research subject (Denzin & Lincoln, 2009).

Observation is a complex data collection method because it involves various factors in its implementation (Adler & Adler, 2012; Creswell, 2013). The method of collecting observation data not only measures the attitude of the respondents, but can also be used to record various phenomena that occur. Observational data collection techniques are suitable for research that aims to study human behavior, work processes, and natural phenomena. This method is also appropriate for respondents whose quantity is not too large.

Types of Observations in Sugiyono (2017) quotes the opinion of Faisal20 who mentions various types of observations, namely participatory, frank and camouflaged, and structured. He also quoted the opinion of Spradley (1980) who mentioned various types of observation, namely passive, moderate, active and complete. However, the four types of observations are included in the participatory observation section. Here's the explanation.

Participant observation is an observation technique in data collection with the researcher directly involved with the social life of the research subject so that the data obtained is more complete and detailed, even understanding the meaning of each behavior that appears. Observation is carried out by the researcher directly participating in the activities carried out by the research group. The researcher then carried out the activities carried out by the group being studied, so that even though they were only making observations, the researcher participated in the activity. This method is very suitable for research that contains psychological aspects, such as impressions, meanings, what is felt, and others. However, this study is considered less objective because the researcher only knows the person being studied or the participants generally know that they are being researched.

Straightforward observation is an observation technique with the researcher declaring himself for observation, in contrast to disguised observation, the researcher does not declare straightforward for observation because he wants to get hidden and confidential data.

Unstructured observations are observations made without a clear research focus and without an observation sheet.

Structured observation involves systematic observation of predetermined variables. Researchers use checklists or observation instruments to record and measure observed behaviors, interactions, or phenomena. Structured observation aims to collect numerical data that can be analyzed statistically. Creswell 2014

Non-participant observation is carried out by not participating or following activities carried out by the group being studied. He only puts himself as a spectator. This data collection technique is usually done secretly, so that participants are not aware that they are being observed. So that data accuracy can be guaranteed. However, researchers must have more knowledge and have read the research theories carried out first because this data collection technique will be difficult if done only by observation.

The general steps of observation are as follows:

1) Choosing an observation site
2) Visiting the observation site by land
3) Identifying who and what is being observed
4) Defining the role of observation
5) Carry out many observations to achieve a complete understanding
6) Designing media to record observations
7) Consider the information to be logged
8) Making descriptive and reflective field notes
9) Showing the existence of researchers in the social environment of observation (Creswell, 2015).

Various Types of Observation and Triangulation of Qualitative Methods

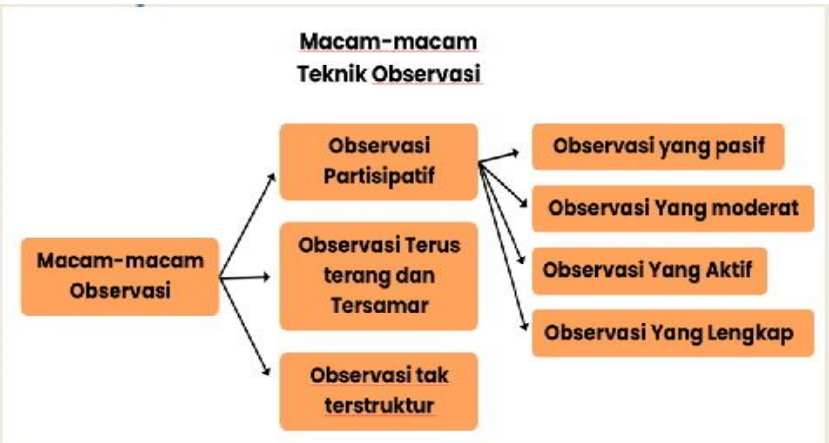

Figure 1. Various Kinds of Qualitative Observations

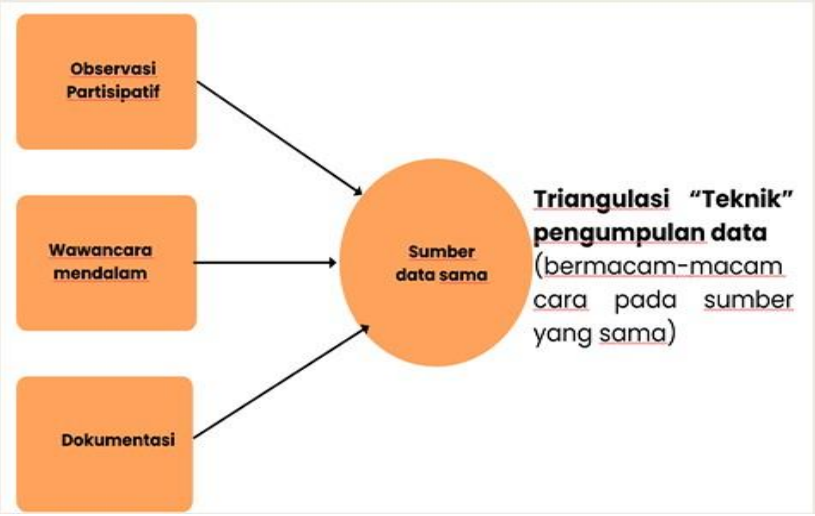

Figure 2. Triangulation System Data Collection Diagram

Documentation

Documentation involves collecting data from documents, archives, or other written materials related to research phenomena. The documents used can be records, reports, letters, books, or other official documents. Documentation studies provide insights into the historical context, policies, events, and developments relevant to the phenomenon being studied (Creswell, 2014). Document study is a data collection method that is not directly aimed at the research subject (Bowen, 2009; Ritchie & Lewis, 2003). Document studies are a type of data collection that examines a wide variety of documents that are useful for analysis materials. Documents that can be used in data collection are divided into two, namely:

1) Primary document: The primary document in the data collection technique is the main document or main document used in the research. Usually, this primary document can be described as a type of data obtained directly from the first hand of the research subject or respondent or resource person, and so on. Examples of primary documents include: autobiography, conducting an interview census, observation, and so on.
2) Secondary documents: Secondary documents are data in data collection techniques that become complementary data (Bryman, 2016; Hart, 1998). This means that the data is obtained not through the first hand of the respondent or resource person, but from the second hand, third hand, and so on. Usually, researchers will give examples of various documents, such as literature or academic manuscripts, newspapers, magazines, pamphlets, and so on as the right medium to get secondary data.

Questionnaire or questionnaire

Questionnaire or questionnaire is a data collection technique that involves questions that have been systematically arranged. Respondents are asked to provide measurable responses through predetermined answer options or by filling in the blanks. Questionnaires or questionnaires are used to collect data from a larger sample in quantitative research (Creswell, 2014). Questionnaire Questionnaire is a method of data collection that is carried out by giving a set of questions or written statements to respondents to answer (Dillman, Smyth, & Christian, 2014; Oppenheim, 2000). Questionnaires are a more efficient data collection method if the researcher has known exactly the variables to be measured and knows what to expect from the respondents. In addition, questionnaires are also suitable for use

when the number of respondents is large enough and spread over a large area. Based on the form of the questions, questionnaires can be categorized into two types, namely open questionnaires and closed questionnaires. An open questionnaire is a questionnaire that gives the research object the freedom to answer. Meanwhile, a closed questionnaire is a questionnaire that has provided a choice of answers for the research object to choose. Along with development, several current studies also apply a questionnaire method that has a semi-open form. In this form, the choice of answer has been given by the researcher, but the object of the research is still given the opportunity to answer according to their wishes.

There are several principles in questionnaire data collection techniques, namely:

1) The content and purpose of the question is intended to measure which one should be on a clear scale and in the choice of answers.
2) The language used must be in accordance with the respondent's ability, so it is impossible to use a language full of foreign terms or a foreign language that the respondent does not understand.
3) Determine the type and form of the question, it can be open or closed.

Research Data Collection Concept

Data collection is a systematic process in research that aims to collect information from various relevant sources to answer predetermined research questions. This process is essential to obtain valid and reliable data, which will support the conclusions of the research. There are two main approaches to data collection: quantitative and qualitative.

Quantitative data collection focuses on collecting numerical data that can be measured and analyzed statistically. This method is often used in research that wants results that can be generalized with a large sample.

Measurement with the aim of producing accurate quantitative data, each instrument must have a scale. The various measurement scales used include, Likert Scale, Guttman Scale, Rating Scale, Semantic Deferential**,** These four types of scales, when used in measurement, will obtain interval data, or ratios. Meanwhile, qualitative data collection relies on detailed and in-depth descriptions of phenomena, often through interviews, observations, and document analysis. Qualitative research seeks to understand the broader context and nuances of the subject being studied.

The data collection procedure in qualitative research involves four types of strategies with their strengths and weaknesses, as shown in Table 1.

Table 1. Different Types, Options, Advantages, and Disadvantages of Qualitative Data 1/2

Jenis	Opsi	Kelebihan	Kelemahan
Observasi	Partisipan utuh peneliti menyembunyikan perannya sebagai observer	Peneliti mendapatkan pengalaman langsung dari partisipan	Peneliti bisa saja tampak sebagai pengganggu
Observasi	Peneliti sebagai partisipan—peneliti menampakkan perannya sebagai observer	Peneliti dapat melakukan perekaman ketika ada informasi yang muncul	Peneliti sangat mungkin tidak dapat melaporkan hasil observasi yang bersifat privat
Observasi	Partisipan sebagai observer—peran observasi sekunder diserahkan kepada partisipan	Aspek-aspek yang tidak biasa, ganjil, atau aneh bisa dideteksi selama observasi	Peneliti dianggap tidak memiliki keterampilan observasi yang baik
Observasi	Peneliti utuh—peneliti mengobservasi tanpa bantuan partisipan	Bermanfaat dalam menggali topik-topik yang mungkin kurang menyenangkan bagi para partisipan untuk dibahas	Sejumlah partisipan (misalnya, siswa) sering kali hanya mendatangkan masalah selama proses penelitian
Wawancara	Berhadap-hadapan—peneliti melakukan wawancara perorangan	Bermanfaat ketika para partisipan tidak dapat langsung diamati	Menyajikan informasi tidak langsung yang disaring melalui pandangan orang yang diwawancarai
Wawancara	Telepon—peneliti mewawancarai partisipan melalui telepon	Partisipan dapat memberikan informasi historis	Keberadaan peneliti mungkin menimbulkan bias respons
Wawancara	Focus group—peneliti mewawancarai partisipan dalam sebuah kelompok	Memungkinkan peneliti mengendalikan alur pertanyaan	Tidak semua orang berbicara dengan jelas dan tanggap

Table 1. Different Types, Options, Advantages, and Weaknesses of Qualitative Data, 2/2

Jenis	Opsi	Kelebihan	Kelemahan
Dokumentasi	Dokumen publik, seperti makalah atau koran	Memungkinkan peneliti memperoleh bahasa dan kata-kata tekstual dari partisipan	Mengharuskan peneliti menggali informasi dari tempat-tempat yang mungkin saja sulit ditemukan
Dokumentasi	Dokumen pribadi, seperti jurnal, diari (buku harian), atau surat	Dapat diakses kapan saja—sumber informasi yang tidak terlalu menonjol	Dokumen perlu disalin atau di-scan agar dapat dimasukkan ke komputer
Dokumentasi	Dokumen ini bisa saja diproteksi dan tidak memberikan akses privat maupun publik	Menyajikan data yang berbobot	Data perlu disalin atau di-scan agar dapat dimasukkan ke komputer
Dokumentasi	Dokumen ini bisa saja tidak autentik atau akurat	Sebagai bukti tertulis, data ini dapat benar-benar menghemat waktu dan biaya	Data perlu disalin atau di-scan agar dapat dimasukkan ke komputer
Audiovisual	Foto-foto	Mungkin merupakan metode pengumpulan data yang tidak mencolok	Mungkin sulit untuk ditafsirkan
Audiovisual	Kaset video	Memberikan kesempatan kepada peserta untuk berbagi realitas yang mereka alami secara langsung	Mungkin tidak dapat diakses secara publik atau pribadi
Audiovisual	Benda seni	Kreatif karena dapat menarik perhatian	Kehadiran dari seorang pengamat (misalnya, fotografer) mungkin akan mengganggu proses
Audiovisual	Pesan komputer, Suara, Film	Memberikan kesempatan kepada peserta untuk berbagi realitas yang mereka alami secara langsung	Mungkin tidak dapat diakses secara publik atau pribadi

Research Instruments

Research Instruments in Qualitative Research are:

1) The interview guide contains a list of questions or topics that will be discussed in a qualitative interview. The interview guide provides a framework for researchers to ask relevant and in-

depth questions to research participants. Interview guidelines can also contain examples of questions that can be used as a guide for researchers (Merriam, 2009).

2) An observation checklist is a tool used to record and pay attention to the aspects that are important in the observation process. The observation checklist contains categories or variables that the researcher will observe during the observation process. Observation checklists assist researchers in organizing and collecting data relevant to the phenomenon being studied (Creswell, 2014).
3) Documentation study guidelines contain guidelines for collecting data from documents or written materials related to research phenomena. Documentation study guidelines can contain clues about the relevant document types, data collection strategies, and aspects that need to be considered in analyzing documentation data (Merriam, 2009).
4) The case study plan contains plans and strategies that will be used in carrying out the case study. The case study plan includes data collection steps, data analysis processes, and stages in reporting case study findings. Case study plans assist researchers in designing and organizing in-depth case studies (Bogdan & Biklen, 2017).
5) The group focus guide contains a framework and questions to be asked in the group focus discussion. Group focus guides provide direction for researchers to facilitate effective discussions and direct attention to topics relevant to the research phenomenon. Group focus guides can also contain techniques or strategies for managing interactions in groups (Creswell, 2014).

Research Instruments in Quantitative Research:

1) Questionnaires or questionnaires are also used as instruments in quantitative research. This instrument contains a series of questions that are used to collect data from respondents. Questions can be closed-ended questions with predetermined answer choices or open-ended questions that allow respondents to give free responses (Creswell, 2014).
2) A structured observation checklist is an instrument used in structured observation. This instrument contains predetermined observation items. Researchers use this checklist to record and measure the variables observed during the observation process (Creswell, 2014).
3) Measurement instruments in experiments include tools or methods used to measure the variables involved in the experiment. These instruments can be measuring scales, electronic devices, or other measuring devices used to collect the necessary numerical data (Creswell, 2014).
4) Survey questionnaires are instruments used in survey studies. This instrument contains a series of questions that are sent to respondents to fill out. Survey questionnaires are designed to collect numerical data that can be statistically analyzed to gain an understanding of the characteristics of a broader population (Creswell, 2014).

Validity of Data Collection Results

a. The importance of Research Data in data collection, both in quantitative and qualitative approaches, plays an important role in ensuring the credibility and reliability of research results. Why data validity is so important and needs to be analyzed during the data collection process:

1) Increasing Trust in Research Results The validity of the data guarantees that the data collected truly reflects the phenomenon to be studied. In quantitative research, this often involves ensuring that the measurement instrument measures the actual variable that it wants to measure. For qualitative research, the validity of the data ensures that the interpretations and conclusions made by the researcher truly reflect the reality of the subject or context being studied.

2) Minimizing Bias: Analyzing the validity of data helps in identifying and mitigating any biases that may arise during data collection or analysis. In quantitative research, the validity of instruments such as content validity and construct can reduce measurement bias. In qualitative research, techniques such as triangulation and member checks help verify data from multiple perspectives, minimizing researcher bias.
3) Supporting the Generalization of Results In quantitative research, the validity of the data is essential to allow the generalization of the results to a wider population. If the data is invalid, the conclusions made may be inaccurate or not applicable to other situations. In qualitative research, although generalization is not the primary goal, the validity of the data is still important to guarantee that the insights and findings are trustworthy and have external relevance. Facilitating Informed Decision Making The validity of the data ensures that the data used in the analysis is an accurate representation of the variables being studied, which is essential for effective data-driven decision-making. In applicable contexts such as public policy, education, and health, decisions informed by valid data can have a significant impact on the quality and effectiveness of the interventions implemented.
4) Improving Scientific Integrity The validity of data is key to maintaining scientific integrity in the research process. Research conducted with high integrity, in which the validity of the data is maintained, tends to make a greater contribution to the scientific community and related practices, building confidence in the scientific findings and recommendations produced. Data validity analysis should be an integral part of the research process to ensure that all phases of the research — from planning to data collection to analysis and reporting — are conducted to the highest standards. Doing this not only improves the quality of research results but also increases trust and reliance on the findings of the study

By adding information about the validity of the research data, it will provide a more complete and useful guide on how to manage and assess data in quantitative and qualitative research.

b. Validity (Validity and Reliability) in Quantitative Data Collection To ensure that the data of the research results are usable and feasible for further analysis, there are several steps and methods that must be followed.

1) Initial Data Check: Ensure there is no missing data and identify outliers.
2) Reliability Measurement: Use Cronbach's Alpha to ensure internal consistency.
3) Validity Measurement: Use loading factors and AVE to measure the validity of constructs.
4) Normality Test: Ensure that the data is normally distributed before performing parametric statistical analysis.
5) Selection of Analysis Method: Select the appropriate analysis method based on the results of the data reliability, validity, and normality checks.
6) By following these steps, it can be ensured that the data obtained is usable and feasible for further analysis.

Validity and reliability are two critical components that determine trust in research data. Data validation techniques include initial data examination, reliability measurement using Cronbach's Alpha, validity measurement with loading factor and Average Variance Extraction (AVE), and data normality test. Quantitative research requires the validity of the instrument to ensure that the measuring tool actually measures what it is supposed to measure and produces consistent data if repeated under the same conditions

c. Validity of Qualitative Research Data

The validity of data in qualitative research refers to the level of confidence that can be given to the researcher's interpretation of the data collected. In a qualitative context, validity is often associated with concepts such as credibility, transferability, dependability, and confirmability, which are designed to provide equal strength to validity and reliability in quantitative research.

Credibility indicates the extent to which the results of the study accurately describe the subject being studied. Ways to increase credibility include the use of triangulation techniques, peer checks, member checks, and long periods of time in data collection.

1) Transferability refers to the extent to which the results of the study can be applied to other contexts. Researchers can improve transferability by providing detailed descriptions of the context and assumptions underlying the research, so that readers can assess the relevance of those results to other situations.
2) Dependability indicates that the research process is consistent and will produce the same results if repeated under similar conditions. To achieve dependability, researchers often conduct process audits, where an outside researcher reviews the research process and methods to ensure consistency.
3) Confirmability refers to the extent to which the results of the study are free from the subjective bias of the researcher. This can be achieved through transparency in data collection and analysis methods, as well as providing sufficient evidence so that conclusions can be reviewed by other parties.
4) Qualitative researchers must use a variety of strategies to ensure that their data is valid, which ultimately affects the strength and confidence of the research findings. Given the unique characteristics of qualitative research, validity includes not only the techniques and procedures used but also the researcher's deep understanding and reflection on its data.

The data credibility test was carried out as follows:

a) Extension of observation.
b) Increased observation diligence
c) Trianguiasis.
d) Peer checking.
e) Member checking.
f) Negative case analysis.

Examples of Qualitative Research Data Collection

Entrepreneurship Education Management at Islamic Entrepreneur Boarding College Sragen Central Java.

Table 2. Example of Qualitative Data Collection Method at IEBC Sragen Islamic Boarding School

No.	Pengumpulan Data	Penjelasan	Lokasi
1	Observasi	Observasi langsung aktivitas dan proses pembelajaran kewirausahaan di IEBC, mencakup interaksi antara pengajar dan santri, aktivitas praktik kewirausahaan, dan fasilitas yang digunakan.	Sragen, Tempat Praktek
2	Wawancara	Wawancara dengan berbagai pihak terkait seperti kepala pesantren, pengajar, santri, ketua yayasan, dan alumni untuk mendapatkan pandangan mendalam tentang pelaksanaan program kewirausahaan. Pertanyaan mencakup perencanaan dan pelaksanaan kurikulum, tantangan yang dihadapi, dan efektivitas program.	Sragen, Online
3	Dokumentasi	Pengumpulan dokumen terkait pelaksanaan program kewirausahaan, termasuk kurikulum, modul ajar, data statistik partisipasi santri, dan laporan kegiatan serta evaluasi program.	Sragen, website, online
4	Triangulasi	Membandingkan data dari berbagai sumber dan metode untuk memastikan keabsahan data. Melibatkan cross-verification antara hasil wawancara, observasi, dan dokumentasi.	Sragen, Online

The data collection method carried out was through the methods of Observation, Interview, Documentation and Triangulation with Education Related Parties at IEBC, according to the Research Object.

Table 3. Object of ExcavationData Collection at IEBC Sragen Islamic Boarding School

No.	Daftar yang Digali	Objek Pekerjaan
1	Kurikulum dan Sistem Pembelajaran	Rencana pembelajaran kewirausahaan, metode pengajaran (praktek langsung, studi kasus, simulasi bisnis), penilaian dan evaluasi pembelajaran.
2	Fasilitas dan Sumber Daya	Fasilitas praktek kewirausahaan (bengkel, laboratorium, ruang praktek), sumber daya pendukung (buku, modul, alat praktek).
3	Pengajar dan Instruktur	Kualifikasi dan kompetensi pengajar, pelatihan dan pengembangan yang diterima oleh pengajar.
4	Santri	Profil santri (latar belakang pendidikan, minat kewirausahaan), pengalaman dan persepsi santri tentang program, keberhasilan santri dalam mengimplementasikan proyek bisnis.
5	Hasil dan Dampak Program	Jumlah santri yang berhasil mendirikan usaha, jenis usaha yang didirikan oleh alumni, dampak ekonomi dan sosial dari usaha yang didirikan.

The method of data collection is carried out by digging up what is an object.

Table 4. Phenomonological Method Questions to Subjects at IEBC Sragen Islamic Boarding School

No.	Data Survei yang Disiapkan	Bahan yang Disiapkan
1	Pertanyaan Wawancara untuk Santri	a. Apa yang Anda pelajari dari program kewirausahaan di pesantren? b. Bagaimana Anda menilai efektivitas metode pengajaran yang digunakan? c. Apa saja tantangan yang Anda hadapi dalam mengikuti program?
2	Pertanyaan Wawancara untuk Pengajar	a. Bagaimana Anda menyusun dan mengimplementasikan kurikulum kewirausahaan? b. Apa saja metode pengajaran yang paling efektif menurut Anda? c. Bagaimana Anda mengevaluasi keberhasilan program?
3	Dokumentasi yang Dikumpulkan	a.Rencana pembelajaran dan silabus. b.Laporan kegiatan dan evaluasi program. c.Data statistik tentang partisipasi dan keberhasilan santri.
4	Observasi yang Dilakukan	a. Observasi langsung kegiatan pembelajaran di kelas dan praktek. b. Observasi fasilitas dan sumber daya yang digunakan dalam program.

The data collection method is carried out by giving a set of questions or written statements to the subject.

Table 5. Validation Method/ Validity of Data Collection Qualitative Method

No.	Aspek Keabsahan	Penjelasan
1	Kredibilitas	Kredibilitas menilai kepercayaan terhadap kebenaran dari temuan penelitian. Dicapai melalui teknik seperti triangulasi, pengecekan anggota, dan waktu yang panjang di lapangan untuk memperdalam pengamatan.
2	Transferabilitas	Transferabilitas mengacu pada kemampuan temuan untuk diterapkan di konteks lain. Ini ditunjukkan melalui deskripsi rinci dari konteks penelitian dan asumsi sehingga pembaca dapat mengevaluasi relevansi dalam situasi mereka.
3	Dependabilitas	Dependabilitas berkaitan dengan konsistensi temuan penelitian. Dapat diuji melalui audit trail, di mana peneliti mendokumentasikan proses penelitian secara detail sehingga penelitian dapat ditinjau kembali oleh pihak lain.
4	Konfirmabilitas	Konfirmabilitas menunjukkan sejauh mana temuan penelitian dipengaruhi oleh objektivitas peneliti dan bukan bias atau motivasi pribadi. Ini sering diuji dengan pengecekan sejawat di mana data dan interpretasi dipresentasikan kepada pihak lain untuk mengevaluasi objektivitasnya.

The results of data collection are continuously excavated and repeated so as to obtain the validity of the data according to the requirements so that further analysis can be carried out with a maximum resultof 31

Examples of Quantitative Research Data Collection

Hypothesis: The Influence of Price, Product Quality, Place and Promotion on Purchase Decisions and the Influence of Purchase Decisions on Consumer Loyalty at Restaurant X.

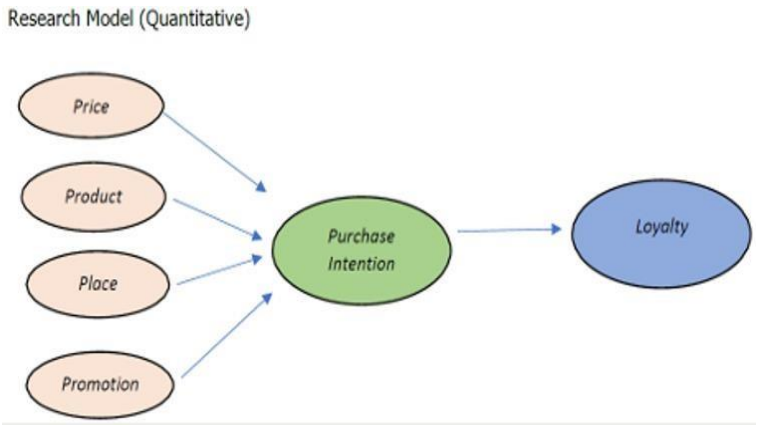

Figure 3. Diagram of the Influence of Marketing Mix on Purchase Decisions and Purchase Loyalty.

The conceptual framework of this study is built based on the relationship between variables obtained from references to previous research journals and theories regarding the marketing mix, purchase decisions and consumer loyalty. From these variables, the operational definition is given, and then the indicators to be measured are determined. From this indicator, it is then elaborated into items of questions or statements. Questionnaire is a method of data collection that is carried out by giving a set of questions or written statements to respondents to answer.32

The steps of the Data Collection Process are as follows: 1) Preparation of Questionnaire Questions (Likert scale); 2) Questionnaire Distribution; 3) Documentation of Questionnaire Results; 4) Initial Screening of Questionnaires; 5) Measurement of Reliability, Validity of the Questionnaire Results Data Table; and 6) Document Data Results.

The Data Questionnaire was addressed to 100 Correspondents, the results of the measurement were unreliable and invalid. Analysis of the use of PLS, so that the number of correspondents is increased to 150 consumers

Table 6. Data from the Quantitative Research Questionnaire on Likert Measurement

NO	HARGA			PRODUK			TEMPAT		
	HG1	HG2	HG3	PROD1	PROD2	PROD3	TP1	TP2	TP3
1	5	4	5	3	4	3	4	3	4
2	5	5	4	3	4	3	3	3	4
3	4	4	4	4	4	4	3	4	3
4	4	5	5	3	3	3	4	4	4
5	4	5	5	5	5	4	5	4	5
6	5	5	4	5	4	5	4	4	5
7	1	2	1	1	1	2	1	2	2
8	3	2	3	2	3	3	3	3	2
9	3	4	4	4	4	5	5	4	4
10	3	3	3	4	4	4	4	5	5
11	4	4	4	4	4	5	5	4	5
12	4	4	3	4	5	4	4	4	4
13	4	5	5	5	5	4	4	3	4
14	5	4	4	4	5	5	3	4	3
15	1	2	1	1	1	2	3	2	2

NO	PROMOSI			KEPUTUSAN PEMBELIAN					LOYALITAS		
	PR1	PR2	PR3	KP1	KP2	KP3	KP4	KP5	LOY 1	LOY 2	LOY 3
1	4	5	4	4	5	4	5	4	4	4	4
2	4	5	4	5	4	5	4	5	4	4	4
3	4	5	5	5	4	5	4	5	4	4	4
4	4	4	4	5	5	5	5	5	4	4	4
5	3	3	4	3	4	3	4	3	3	3	4
6	3	4	3	4	3	4	3	4	3	3	4
7	3	2	2	3	2	2	2	2	2	3	2
8	1	2	2	2	1	2	2	2	1	2	1
9	4	3	4	5	4	5	2	2	4	4	4
10	4	4	4	5	5	5	2	2	4	4	4
11	4	3	4	4	5	4	2	2	4	4	4
12	4	4	4	5	5	5	2	2	4	4	4
13	5	4	4	4	4	4	4	4	3	3	3
14	5	5	5	3	3	4	3	4	3	4	3
15	1	1	2	3	2	3	2	3	2	2	2

The results of Reliability with Crombachs Alpha between 0913-0.942 >0.7, and Load Factor between 0.8390, 0>9560.7 are very good, AVE between 0.791-0.990>0.5, means that the measurement results of the variable instrument are reliable and valid, the Research Proposal can be continued.

Validation of Quantitative Research Data Results

To ensure that the data from the research results is usable and feasible for further analysis, there are several Steps and methods that must be followed:

1. Initial Data Check: Ensure there is no missing data and identify outliers.
2. Reliability Measurement: Use Cronbach's Alpha to ensure internal consistency.
3. Validity Measurement: Use loading factors and AVE to measure the validity of constructs.
4. Normality Test: Ensure that the data is normally distributed before performing parametric statistical analysis.
5. Selection of Analysis Method: Select the appropriate analysis method based on the results of the data reliability, validity, and normality checks.

By following these steps, it can be ensured that the data obtained can be used and is feasible for further analysis of Reliability and Validation of Quantitative Research Data Results Hinton et al. (2004) provide four categories of reliability, namely: excellent (0.90 and above), high (0.70 0.90), medium (0.50-0.70), and low (0.50 and below). Load Factor Validity Requirements >0.7 with Average Variance Extracted (AVE)AVE >0.5.

Differences in Quantitative, Qualitative and Mixed Research

Table 7. Data Characteristics and Data Analysis in Quantitative, Qualitative and Mixed Research

No.	Uraian (Karakteristik)	Kuantitatif	Kualitatif	Campuran
1	Data	Data kuantitatif berupa angka atau data yang dapat diukur.	Data kualitatif berupa kata-kata, gambar, atau objek.	Menggunakan data kualitatif dan kuantitatif
2	Metode Pengumpulan Data	Survei, eksperimen, kuesioner, dan analisis statistik	Wawancara mendalam, observasi partisipatif, analisis dokumen, dan diskusi kelompok terarah (focus groups).	Kombinasi wawancara, survei, observasi, dan analisis statistik
3	Reliabilitas Data	Menggunakan nilai Cronbach's Alpha > 0.7 untuk mengukur konsistensi internal.	Konsep kredibilitas, transferabilitas, dependabilitas, dan konfirmabilitas, metode triangulasi	Kombinasi dari kedua metode, reliabilitas dapat bervariasi tergantung pada metode yang digunakan untuk pengumpulan data.
4	Validitas Data	Mmenggunakan nilai loading factor > 0.7 dan Average Variance Extracted (AVE) > 0.5 untuk memastikan validitas konvergen.	Konsep kredibilitas, transferabilitas, dependabilitas, dan konfirmabilitas, metode triangulasi	Menggabungkan validitas internal dari data kualitatif dan validitas eksternal dari data kuantitatif untuk menghasilkan pemahaman yang lebih komprehensif.
5	Analisis Data	Deduktif, menggunakan metode statistik seperti regresi, analisis varian (ANOVA), dan uji t.	Induktif, menggunakan metode seperti analisis tematik, analisis naratif, dan analisis konten.	Menggabungkan analisis induktif dan deduktif, sering menggunakan strategi seperti triangulasi untuk memastikan validitas hasil.

Table 2. It provides a complete explanation of the differences in the characteristics of each research method, including data, data collection methods, data reliability, data validity, and data analysis with additional explanations of reliability and validity in the context of quantitative, qualitative and mixed research.

CONCLUSION

This study reveals the importance of selecting the right data collection methods and techniques in quantitative and qualitative research to ensure the validity and reliability of the results. The data collection method should be selected based on its suitability to the nature of the research question, where quantitative research uses methods that generate numerical data and qualitative research

focuses on in-depth descriptive data. The selection of accurate data sources is also crucial, as credible sources ensure the authenticity and accuracy of the data collected.

Research instruments should be carefully designed to measure the desired variables effectively, with validity and reliability that have been tested to avoid misinterpretation of the data. The validity of data collection methods and instruments is fundamental in determining the reliability of study results, as this directly affects the ability of researchers to generalize findings beyond the sample studied.

In conclusion, the validity of the data, in both quantitative and qualitative research, determines the general success in reaching reliable and evidence-based conclusions. Therefore, the selection of the right data collection techniques, credible data sources, and verification of research instruments are the keys to obtaining valid and reliable results. The implementation of these steps in research will help in the development of broader science and practical applications of such research.

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