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## The Comparative Advantage of Digital and Face-to-Face Data Collection in 21st-Century Research: Evidence from Agricultural Research

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#### Abstract

**Objective:** The aim of this study was to determine the comparative advantages of digital media and face-to-face in data collection.

**Methods:** The researcher used the descriptive survey research design. The sample size was 330 researchers from the field of agriculture. The questionnaire was used as the instrument for data collection, and the results were presented in tables and one chart. The data for the study were analysed using percentages and mean.

**Result:** The advantages of digital media over a face-to-face approach to data collection include the ability to collect large data, the possibility of collecting diverse data, cost-effectiveness, access to more data, timely collection of data and the possibility of tracing collected data. The advantages of face-to-face data collection include interaction with participants, direct observation, deeper probing, use of non-verbal cues, control over data collection, better data quality and supervision of the data collection process. The researcher also found that the nature of a study determines the choice of the data collection process. The factors that influence the choice of data collection include the volume of data involved, the location of participants, educational level, participants' digital skills, availability of resources, the study's time frame and the researchers' digital skills.

**Conclusion:** Although, digital media platforms have significantly changed the face of data collection, the face-to-face mode of data collection is also essential because it has advantages.

Keywords: agriculture; advantage; face-to-face; digital media; research

#### Introduction

The advent of digital media has significantly changed the face of nearly every aspect of contemporary society. Hardly any aspect of human society is inhumed to the powerful effect of digital technologies. According to Suryandari (2020), digital technologies are seriously driving changes in society, and people are adjusting based on the demands of the current society. This means that the field of agriculture has also been significantly impacted in different ways by the powerful wave of digital media. According to Weersink et al. (2018), agricultural research has transformed significantly due to the effect of digital media tools. The researchers note further that digital tools like Internet of Things devices, sensors, and mobile applications, among others, have

changed the debate and agricultural research activities. Although digital media has affected different aspects of digital media, the current study focused on the impact of digital media on research, with particular reference to data collection.

Data collection is at the centre of research because, for any scientific inquiry to be effectively conducted and concluded, data needs to be collected and analysed before any valid conclusion can be drawn. Data collection, in the context of research, is the processing of gathering information with the aim of answering research questions or testing hypotheses. In the views of Faryadi (2019), before researchers make decisions on their data collection process, they must take into consideration the type of data they require, the method that will be suitable for the data collection procedure, as well as the ethical requirements that they must fulfil. Mwita (2022) argues that in choosing a data collection method, the primary consideration should be the nature of the research question or problem to be addressed. This is particularly true because each research problem or question is unique in its way, and the approach must equally be unique. It is essential to note here that the research design deployed by a researcher is crucial in determining the data collection procedure. The decision on the research design is also influenced by the research problem to be addressed. Pickard (2018) corroborates that researchers could utilise designs-like experiments, surveys, or secondary data analysis in quantitative research. On the other hand, in qualitative studies, a researcher can use approaches such as focus group discussion, ethnography, interviews, or observations. The central argument here is that, the research problem will determine the choice of design, and the choice of design alongside the research problem influences the data collection process.

Another crucial point to raise here is the role of the feasibility of the data collection procedure. A researcher needs to consider how feasible it is to collect data through a particular procedure. Every method of data collection has its strengths and weaknesses. Therefore, researchers must bear this in mind when making a decision on the choice of data analysis procedure. Mwita (2022) affirms that the failure of a researcher to choose the right of data collection could negatively impact the research procedure. For example, a researcher who wants to study Nigeria must make sure that the choice of data collection is determined by the ability to execute the data collection procedure. If it is impossible to sample the entire nation, then the research may decide to use some selected states and generalise the result to the rest of the nation. However, this must be done scientifically and systematically.

Data collection in agricultural research can be divided into digital and face-to-face approaches. The collection of data in agriculture through a digital approach is called digital agriculture. It entails the gathering of data through digital media platforms. The digital platforms through which people can gather data in agricultural research include social media channels like Facebook, WhatsApp, and X (formerly Twitter). Google Forms and Survey Monkey are among the others. Using digital media platforms for data collection in agricultural research is essential because it has some advantages. For instance, with the use of digital media platforms, data could be gathered in large quantities from different sources (Chaterji et al., 2020). According to Pan et al. (2023), using the Internet of Things and sensors makes it possible to remotely monitor environmental conditions, livestock behaviour, and crop performance and gather other relevant data that could guide agricultural decision-making. Researchers (Facca et al., 2020; Harrison 2023; Jackson, 2022; Ohme et al., 2024) agree that data collection in research has been impacted

by digital media. Another advantage is that digital media platforms allow for real-time data collection and monitoring that facilitate rapid response, especially during emergencies like sudden weather changes and floods. The potential limitation of digital media use for data collection is that having a large volume of data could also pose a serious problem during the analysis stage. In addition, data collection through digital platforms could also raise ethical issues. According to Efebeh et al. (2024), using digital media for data collection has posed serious ethical challenges. Okereka et al. (2024) conducted a study and reported that digital media has significantly changed data collection.

Face-to-face data collection also has its advantages as it provides deeper insights and enables researchers to understand the context of their study. According to Kim et al. (2008), despite the central role of digital media in data collection and analysis, it is crucial to appreciate the important role of face-to-face data collection. The researcher noted that although data collection through digital media is useful in research when sensitive information is involved, face-to-face is more valued and better so that the participants are more relaxed about providing the information required. Fountas et al. (2020) say that during face-to-face interaction in data collection, the researchers are able to understand the unique challenges that participants are facing, and this will help them manage the data collection process better. Another potential advantage of data collection in face-to-face setting is that participants without digital competence can also participate. Such participants will have their options read out to them before they can make their choices. However, in a digital setting, participants without digital competence are left out. The argument is rich from both sides of the divide. However, limited studies have compared the advantages of using either digital media or face-to-face in data collection. Such a study is essential to provide empirical evidence that could guide researchers on the best data collection methods in 21<sup>st</sup>-century society.

# **Objectives of the study**

The general objective of this study was to determine the comparative advantage of digital media in data collection over face-to-face. The specific advantages are:

- 1. To determine the advantages of digital media over face-to-face data collection in agricultural research.
- 2. To determine the advantages of face-to-face data collection over digital media in agricultural research.
- 3. To determine whether digital media or face-to-face is more effective in data collection in agricultural research.
- 4. To ascertain the factors that should determine the choice of data collection procedure in research.

# Methods

The methods that were used in this study are presented in the following subheadings:

**Design of the study:** The researchers used the survey research design to collect data for this study. The choice of a descriptive survey was because of its ability to generate data in large volumes.

With the help of a descriptive survey, the researchers were able to gather data from agricultural researchers on the advantages of digital media and face-to-face data collection in research.

**Population of the study:** This study's target population was agricultural researchers who have published at least two manuscripts in a year in the last five years. The manuscripts must have been published in journals indexed in either Web of Science or Scopus. Unfortunately, no list contains the number of agricultural researchers who fit this description. Therefore, the population of this study is infinite.

**Sample size/Sampling technique:** This study's sample size was 330 researchers of agricultural backgrounds. The researcher arrived at the sample size after conducting a priori power analysis using G-Power version 3.0. The sampling technique was a respondents-driven chain referral sampling technique. The process began with the identification of the initial participants through social media announcements. The participants then recommended other participants, and the process continued until all 330 participants were sampled.

**Instrument/validation and reliability:** The researchers used a structured questionnaire to collect data for the study. They chose this instrument because it can generate large volumes of data. The instrument collected both demographic and psychographic data from the participants. It was divided into sections A and B, respectively. The response format was a combination of multiple options and a four-point Likert Scale. Three experts in agricultural research validated the instrument, examining its logicality, clarity, and appropriateness. A pilot study with 30 participants (15 males and 15 females) was used to determine the instrument's reliability. The result revealed a Cronbach Alpha of .78, meaning the instrument was reliable.

**Data collection and analysis:** This study collected data by sorting out the participants' responses and coding them for analysis. The researcher used mean, standard deviation, and percentages. The results were presented in tables.

# **Results/Discussion**

Among the 330 questionnaire copies that were filled out, 21 were incomplete and, therefore, were not used. This means that the study's return rate was 94%, which was considered appropriate for data analysis. The sample was 61% males and 39% females. Also, 56% of the participants had doctorate degrees, suggesting most had terminal degrees. The mean age of the participants was 47 years. In the area of career level, the majority (59%) had put in ten years or more in their careers as researchers. All the participants were lecturers at universities. The result of the study is further presented based on the objectives of the study as shown below:

S/N	Items	Mean	SD	Remark
1	Large data collection is more possible.	3.4	.67	Accepted
2	It is more possible to collect diverse data.	3.2	.54	Accepted
3	It is more cost-effective.	2.8	.77	Accepted
4	It provides access to more data.	3.1	.43	Accepted
5	It ensures timely collection of data.	2.6	.78	Accepted
6	It is more possible to trace data collected through digital media.	2.9	.34	Accepted
7	It gives room for more replicability.	2.4	.78	Rejected

 Table 1: The advantages of digital media over face-to-face data collection in research.

In Table 1, the researcher determined the advantages of digital media data collection over face-toface. The result of the study revealed that six out of the seven items were accepted as the advantages of digital media over face-to-face data collection. The participants rejected the item on replicability, indicating that replicability of research cannot be viewed as an advantage of digital media data collection over face-to-face. Overall, the results suggest that digital media data collection has some advantages over the face-to-face approach. This result has extended the study of Okereka et al. (2024), who examined the impact of digital media on data collection without looking at the advantages of digital media over face-to-face data collection. Therefore, the current study did not just examine the usefulness of digital media in data collection but also explored how advantages of digital media in comparison with face-to-face approach.

Table 2:	The advantages	of face-to-face	data collection	over digital	media in r	esearch.
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S/N	Items	Mean	SD	Remark
1	It allows for more direct interaction with participants	3.0	.32	Accepted
2	It allows for direct observations.	3.1	.43	Accepted
3	It allows for deeper probing.	2.9	.12	Accepted
4	It allows for the use of non-verbal cues	3.0	.98	Accepted
5	It allows for control over data collection	2.8	.54	Accepted
6	It leads to better-quality data	2.8	.90	Accepted
7	It allows for supervision of the data collection	2.5	.71	Accepted

The researcher computed Table 2 to determine the advantages of face-to-face data collection over digital media-based data collection. All seven items were accepted as the advantages of face-to-face data collection over digital media. Thus, face-to-face data collection also has its advantages. This study has extended that of Fountas et al. (2020) who examined the usefulness of face-to-face in data collection but did not compare it with digital media. The implication is that the face-to-face approach is still a useful approach in data collection. This information is useful because it could serve as a guide in assisting researchers in making data collection decisions.





Figure 1: Comparing the effectiveness of face-to-face and digital media data collection

In Figure 1, the researcher determined which of digital media and face-to-face data collection is more effective. The results revealed that the majority of the participants indicated that either strategy can be effective, but it depends on the nature of the study. The researcher, therefore, computed Table 3 to determine the factors that influence the choice of data collection procedure. This result has extended the study of Okereka et al. (2024), whose study examined the impact of digital media on data collection but did not compare it with face-to-face data collection. Fountas et al. (2020) noted that face-to-face data collection is still useful, but their study did not compare face-to-face data collection with digital media-assisted strategy. Effebeh et al. (2024) reported that digital media with face-to-face approach. Therefore, the current study did not just look at digital media and data collection but also compared it with face-to-face. This information could be useful to researchers when making decisions on data collection.

Table 3: The factors that should determine the choice of data collection procedure in research.

S/N	Items	Mean	SD	Remark
1	The volume of data involved	3.2	.60	Accepted
2	The location of the participants	3.0	.51	Accepted
3	The educational level of the participants	3.1	.98	Accepted
4	The digital skills of the participants	2.8	.21	Accepted
5	Availability of resources	2.6	.70	Accepted
6	Time frame for the study	3.2	.22	Accepted
7	The digital skills of the researchers	2.7	.89	Accepted

Table 3 reveals the factors that determine the choice of data collection procedure. The result of shows that all seven items were accepted as factors that determine the choice of data collection in research. This result has confirmed the studies of Mwita (2020) and Kim et al. (2008), who reported that a range of factors influence data collection and that researchers must keep such in mind when making such decisions. The unique thing about the current study is that it focused on agricultural researchers, unlike the studies mentioned above. This means that the current study is more precise in its approach and strategy.

#### **Conclusion/Recommendations**

Based on the results of this study, the researcher concludes that digital media platforms have significantly changed the face of data collection. However, the face-to-face mode of data collection is also essential because it has advantages. A range of factors, like the volume of the data, availability of funds, and time frame, among others, determines the decision on which mode of data collection to use. The basic contribution of this study is that it has provided empirical data to explain the comparative advantages of digital media and face-to-face data collection procedures. This information could help other researchers justify their choice of data collection strategy. Therefore, the usefulness of this study goes beyond agriculture; those from other disciplines can also benefit from the study. This study makes three broad recommendations. First, researchers should consider the uniqueness of their studies before arriving at the choice of data collection. Second, the advantages and weaknesses of each of the data collection methods should be considered when making decisions on data collection. Finally, further research should be conducted to explore the comparative advantage of digital media-assisted and manual analysis.

#### References

- Chaterji, S., DeLay, N D., Evans, J., Mosier, N S., Engel, B A., Buckmaster, D R., & Chandra, R. (2020, January 1). Artificial Intelligence for Digital Agriculture at Scale: Techniques, Policies, and Challenges. Cornell University. https://doi.org/10.48550/arxiv.2001.09786
- Efebeh, V. E., Orishede, F., &Igoh, J. M. (2024). Artificial Intelligence and Academic Research in Contemporary Society: Evidence from University Academics. *Ianna Journal of Interdisciplinary* Studies, 6(3), 33–44. Retrieved from <u>https://iannajournalofinterdisciplinarystudies.com/index.php/1/article/view/329</u>
- Facca, D., Smith, M., Shelley, J., Lizotte, D. Donelle, L. (2020). Exploring the ethical issues in research using digital data collection strategies with minors: A scoping review. *PLoS ONE* 15(8): e0237875. <u>https://doi.org/10.1371/journal.pone.0237875</u>
- Faryadi, Q. (2018). PhD Thesis Writing Process: A Systematic Approach—How to Write Your Methodology, Results and Conclusion. Creative Education, 9(04), 2534-2545.
- Fountas, S., Espejo-García, B., Kasimati, A., Mylonas, N., & Darra, N. (2020, January 1). The Future of Digital Agriculture: Technologies and Opportunities. IEEE Computer Society, 22(1), 24-28. https://doi.org/10.1109/mitp.2019.2963412
- Harrison, S., Alderdice, F. & Quigley, M.A. (2023). Impact of sampling and data collection methods on maternity survey response: a randomised controlled trial of paper and push-to-

web surveys and a concurrent social media survey. *BMC Medical Research Methodology*,23, (10),1-12. <u>https://doi.org/10.1186/s12874-023-01833-8</u>

- Jackson, J. (2022). Expanding opportunities to maximise research recruitment and data collection using digital tools. *International Journal of Social Research Methodology*, 26(6), 721–731. https://doi.org/10.1080/13645579.2022.2091258
- Kim, J., Dubowitz, H., Hudson-Martin, E., & Lane, W G. (2008, July 1). Comparison of 3 Data Collection Methods for Gathering Sensitive and Less Sensitive Information. *Ambulatory Pediatrics* 8(4), 255-260. https://doi.org/10.1016/j.ambp.2008.03.033
- Mwita, K. (2022). Factors to consider when choosing data collection methods. *International Journal of Research in Business and Social Science* (2147–4478), 11(5), 532–538. https://doi.org/10.20525/ijrbs.v11i5.1842
- Ohme, J. Theo, A., Laura, B., Deen, F., Nilam, R., Byron, B. & Thomas N. R. (2024). Digital trace data collection for social media effects research: apis, data donation, and (screen) tracking, *Communication Methods and Measures*, 18:2, 124-141, DOI: 10.1080/19312458.2023.2181319
- Okereka, O. P., Orhero, A. E., &Okolie, U. C. (2024). Digital media and data collection in social and management sciences research in Nigeria. *Ianna Journal of Interdisciplinary Studies*, 6(1), 76–89. Retrieved from https://iannajournalofinterdisciplinarystudies.com/index.php/1/article/view/176
- Pan, Y., Sun, J., Yu, H., Bai, G., Ge, Y., Luck, J D., &Awada, T. (2023). Transforming agriculture with intelligent data management and insights. 2023 IEEE International Conference on Big Data held in Sorrento between 15, 2023 → Dec 18 2023 https://doi.org/10.1109/bigdata59044.2023.10386589
- Pickard, A. (2018). Data collection techniques. In *Research Methods in Information* (Chapter three) 189-194. <u>https://doi.org/10.29085/9781783300235.021</u>
- Suryandari, N. (2020, January 1). Digital Revolution and the Development of Tourism Business.2nd International Media Conference 2019 (IMC 2019) <u>https://doi.org/10.2991/assehr.k.200325.025</u>
- Weersink, A., Fraser, E D., Pannell, D J., Duncan, E., &Rotz, S. (2018, May 31). Opportunities and Challenges for Big Data in Agricultural and Environmental Analysis. *Annual Reviews*, 10(1), 19-37. <u>https://doi.org/10.1146/annurev-resource-100516-053654</u>