

# Post COVID-19: New Breakthroughs and the Future of Behavioural Research Data Collection

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**Abstract:** Behavioural researchers have been faced with challenges associated with the choice of data collection methods that is timely and cost-effective for all situations. Several studies have examined various means of collecting data while some electronic means of data collection have been explored. However, there is a need for a study that compares the conventional and contemporary data collection methods in terms of profile, perceptions and prospects. Therefore, this study examined the new breakthroughs and the future of behavioural research data collection in post COVID-19 era. The study is underpinned by connectivism learning theory within ex-post facto design with a sample of one hundred and twenty-six (126) behavioural science researchers. Post COVID-19 Data Collection Methods Scale-Forms App ( $r=0.86$ ) was used, and the data collected were analysed using frequency count and t-test. The findings showed that there were more users of breakthrough methods 47 (37.3%) than conventional 39 (30.9%) and mixed method 40 (31.7%). Conventional methods were less available than new breakthrough methods. There is a significant difference in the perception, challenges and prospects of the conventional and breakthroughs in behavioural research data collection methods, all in favour of new breakthroughs.

It is, therefore, recommended that behavioural researchers, as well as other researchers, avail themselves of the opportunities offered by the new breakthrough to advance their research endeavours in post COVID-19 era.

**Keywords:** Post COVID-19, research, breakthrough, data collection, connectivism learning theory.

## 1. Introduction

One of the significant benefits of research is the discovery of new knowledge, which birthed a new idea for collecting data towards solving people's problems. It has also led to the involvement of a systematic and rigorous approach to bring a new and explicit response to a clearly defined problem (Esteban et al., 2021; Morenikeji, 2006). Its impact on the advancement and improvement of knowledge cannot be overemphasised in various fields. Its application and use are essential for national development. For these reasons, every nation must not underestimate the efforts of research institutes and researchers but try to give them adequate support as it has the propensity to enhance the standard of living of the people. Countries that contribute largely to the research sector enjoy enormous benefits. Hence, this may be the reason for the argument that research must be relevant, flexible, and sustainable in the manner and ways of collecting its data to enable sustainable solutions for humanity (Igwe-Kalu, 2018).

According to Schleicher (2020), data collection is an important aspect of research. It finds answers to research questions, evaluates results, and predicts trends and probabilities. To arrive at an accurate decision, it is essential to gather accurate data to ensure the quality and integrity of the research. In the past, the data were collected through conventional paper and pencil, like questionnaires, physical observation, interviews, focus groups, and so on. However, this process is faced with challenges like

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non-accessibility to respondents, misbehaviour of respondents, cost, inaccurate data, time consumption, among others. These were the order before the COVID-19 pandemic (Schleicher, 2020).

The blowout of COVID-19 has greatly affected the world irrespective of nationality, religion, profession, income, and education. The research sector was not exempted from this crisis. Data collection, a vital aspect of research, became difficult and, in some circumstances, became impossible because of the lockdown. Igwe-Kalu (2018) reported that, to this end, there are a lot of inefficiencies and inadequacies from the unavailability of devices needed to search for the latest information and data. Also, there is a wide gap between the data needed and data access (Igwe-Kalu, 2018).

The lockdowns in response to COVID-19 have interrupted all activities nationwide and behavioural research. Behavioural research is a way to examine and understand individual and social behaviour through measurement and interpretation. Cozby and Bates (2018) expressed the general goal of behavioural science research to describe behaviour, predict, determine the cause, and understand or explain it. The effects of lockdown interrupted nearly all essential aspects of behavioural research, most importantly, data collection is not left out. During this crisis, alternative data collection methods (mainly online data collection) become more prevalent and widely adopted (Schleicher, 2020). The move to online data collection methods results in different approaches to analysing the results thereof. Research institutes are increasingly looking towards international policy experiences for data and analyses as they develop their policy responses to trail the aftermath of the pandemic.

There is no doubt the COVID-19 pandemic has disrupted research, especially the data collection process. However, this has not led to a cessation of research, instead, online platforms called breakthroughs were created to gather data through digital devices. With these breakthrough methods, researchers are able to continue to contribute to knowledge (Rapanta et al., 2020). With this, there is a migration from the traditional methods of data collection to the breakthrough methods. According to Alimin (2020), breakthroughs in data collection are ways out of obstacles to progress, connecting data sources to users through the help of technology to advance research. With these new methods, however, researchers may be faced with technical issues, unavailability of devices, bad internet connection, power outages, and respondents not being exposed to the use of the new tools. Also, some researchers preferred interaction with respondents as they may not take the remote seriously (Rapanta et al., 2020).

Apart from these challenges identified by researchers, remote data collection can be easier if things are in place. There are several online tools used for data collection; among them are; survey monkey (Jinadu and Balogun, 2020), qualtrics (Jinadu et al., 2021), google forms (Simplilearn, 2023; Cristobal-Fransi et al., 2020), telephone interviewing (Omodan, 2020), survey planet and other data collection methods. Therefore, it is important to spread awareness and the use of these tools to the public as it will significantly enhance the data collection process (Simplilearn, 2023). And could also make data analysis very easy for researchers, so proper training should be ensured.

As current data collection moves from traditional to modern, it can be predicted that the future of data collection will be interactive, flexible and accessible. Over the past 20 years, the increasing use of smartphones and connected devices has drastically changed the way we obtain information. Advances in technology have made it much easier for researchers and groups of individuals to collect, store and use information. Technology is advancing very fast, making it easy to gather other relevant information from anywhere in the world. Tech companies and start-ups are working towards data unification across the globe to make data flexible and accessible enough to support different options ranging from offline data analysis to real-time machine learning (Anderson et al., 2020).

Arising from the challenges imposed by the global pandemic, the new breakthrough in data collection during post COVID-19 era and after has seen researchers shift from conventional to a new

breakthrough. Though previous studies have examined either the conventional data collection methods or post COVID-19 and education generally. There appears to be a dearth of literature that will compare the conventional method of data collection and the breakthrough methods, especially in behavioural research. Therefore, this study examined the level of availability, perception, challenges, and prospects of the conventional and breakthrough data collection methods to advance the future of behavioural research.

### **1.1 Theoretical framework: Connectivism learning theory**

The study is anchored on connectivism learning theory. Connectivism was first introduced in 2005 by two theorists, George Siemens and Stephen Downes (Downes, 2010; Mackness et al., 2010; Duke et al., 2013). The theory was made popular through Siemen's article connectivism: learning as network creation and Downes's article, an introduction to connective knowledge. Connectivism is a relatively new learning theory. According to Siemens (2004), the theory suggests learners should combine thoughts, theories and general information in a useful manner. It accepts that technology is a major part of learning process and that our constant connectedness gives us opportunities to make choices about our learning. Connectivism promotes learning that happens outside of an individual, such as through social media, online networks, blogs, or information databases. In line with this study, connectivism addresses the issue of challenges that may beset the traditional methods of doing things and appreciate the introduction of technology to overcome human and posthuman challenges (Omodan, 2022; Omodan, 2023).

Siemens (2005) identified the principle of connectivism as learning and knowledge rest in diversity of opinion, learning is a process of connecting specialised nodes or information sources, and learning may reside in non-human appliances. That is, connectivism relies heavily on technology, so the first step to creating a connectivist research is to introduce more opportunities for digital research data collection, herein called breakthroughs. Siemen sets a bold research agenda around sharing tasks between people and technology (Bell, 2011).

This theory is relevant to this study because it suggests that show we collect and analyse data is changing, with a greater emphasis on networks and connections rather than isolated data points. This is particularly relevant in behavioural research, where data is often complex and multi-dimensional. Using technology to collect and analyse data, researchers can more easily identify patterns and connections that might have otherwise gone unnoticed. Overall, the principles of connectivism theory are highly relevant to new breakthroughs and the future of behavioural research data collection. By embracing new technologies and networks, researchers can enhance their understanding of complex behaviours and ultimately contribute to new breakthroughs in the field.

### **1.2 Research questions**

- What is the profile of the conventional and breakthroughs in behavioural research data collection methods in terms of use and availability?
- Is there any significant difference in the perception of the conventional and breakthroughs in behavioural research data collection methods?
- Is there any significant difference in the challenges of conventional and breakthroughs in behavioural research data collection methods?
- Is there any significant difference in the prospects of conventional and breakthroughs in behavioural research data collection methods?

## **2. Research Methods**

### **2.1 Research design**

The study used ex-post facto design. According to Lee (2011), research design is a plan and structure of investigation to obtain answers to research questions. Its plan is the overall scheme or programme of the research and what the investigator will do, from writing the hypotheses to the final analysis of data. Its structure is the framework, organisation or configuration of elements of the structure related in specified ways. Ex post facto design became necessary because it allowed the researchers to compare the two data collection methods and draw inferences. This is relevant because it examines the cause-and-effect relationship between independent and dependent variables (Apuke, 2017). It also hypothesises how the independent variable, which is not controlled or manipulated, influences or affects the dependent variable (Johnson, 2001). This research design is useful when conducting an experiment is impossible, impractical, costly or unethical. It is also used where the independent variable lies outside the researcher's control (Bayyan, 2016).

### **2.3 Population, sample and sampling technique**

The population for this study is all researchers in a particular university in Oyo State, Nigeria. Specifically, graduate students and lecturers in the behavioural sciences faculties of the University are the target population for this study. Multi-stage sampling procedure was adopted to select samples. There are thirteen faculties in the University. In the first stage, the purposive sampling technique was used to select faculties of social science and education. The reason behind this selection is that the two faculties conduct behavioural research. In the second stage, simple random sampling was used to select three departments, each from the two behavioural sciences faculties within the university. In the third stage, from each department selected, convenience sampling was used to select twenty (21) researchers as follows: twenty (20) postgraduate research students and one (1) lecturer. A total sample of one hundred and twenty-six (126) behavioural science researchers participated in the study.

### **2.4 Instrumentation, reliability and validity**

Post-COVID-19 Data Collection Methods Scale-Forms App (PDCMS-FA) was used to collect data. The researchers developed PDCMS-FA to measure behavioural researchers' methods of data collection. It is an online Google form consisting of two sections, A and B. Section A, sought participants' demographic information such as faculty, gender, age, designation and the number of publications. Section B is on the data collection method based on five indicators: availability, awareness, perception, challenges, and prospects (Surveyheart.com, 2023). The initial tests contained forty-eight items in which participants were asked to respond on four-point scale of always-4, sometimes-3, rarely-2, and never-1; however, the scoring was reversed for negative items. These items were subjected to pilot testing using testees who were not part of the final sample for the study. The content validity was established by giving the draft to psychometricians in the field of assessment and testing, where irrelevant items were deleted or modified and others subsequently retained. To determine the reliability of the instrument, the internal consistency of the instrument was obtained using Chronbach's Alpha method of reliability, which yielded a value of 0.862.

### **2.5 Analysis and ethical consideration**

Frequency count and t-test were used to analyse the data. The issue of ethical consideration was observed by ensuring that the participants were given the liberty to respond in their own thought without imposition or coercion. They were given the freedom to withdraw from participation in the research exercise at any stage if they feel uncomfortable with the process. To protect their identities from any unforeseen or potential danger in line with data protection and governance as entrenched by the Nigeria Communication Commission (NCC) of the Federal Ministry of Community and

Digital Economy policy, they were taken as anonymous as their names were not requested nor recorded and the data collected were treated with confidentiality and solely for research purpose only.

### 3. Presentation of Results

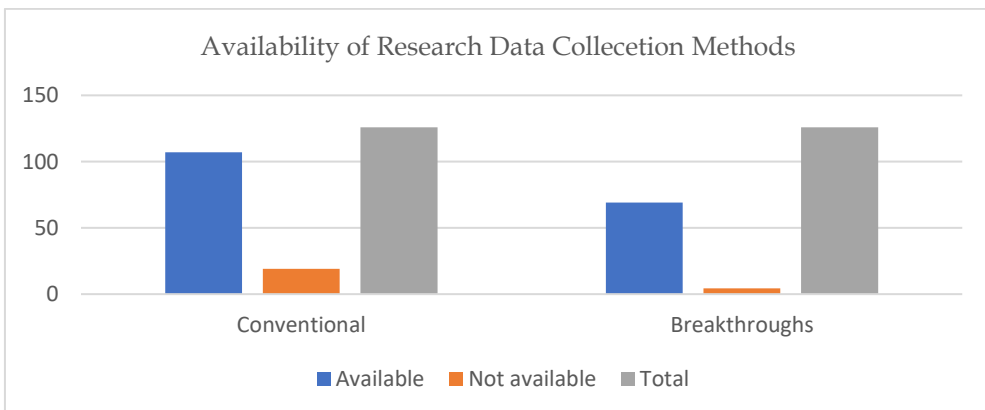
This section deals with the results of data analysis in the order in which the research questions were raised. The research questions were also presented and answered in order of difficulty and technical levels, from descriptive to inferential. It started with a simple frequency count to a more technical result t-test.

**Research question 1:** What is the profile of the conventional and breakthroughs in behavioural research data collection methods in terms of use and availability?

*Table 1: Profile of data collection methods in behavioural research*

S/N	Profile	Frequency	%
<b>1</b>	<b>Method Use</b>		
	Convectional only	39	30.9
	Breakthroughs only	47	37.3
	Conventional + Breakthroughs	40	31.7
	<b>Total</b>	<b>126</b>	<b>100</b>
<b>2</b>	<b>Availability of conventional method</b>		
	Available	107	84.9
	Not available	19	15.1
	<b>Total</b>	<b>126</b>	<b>100</b>
<b>3</b>	<b>Availability of new breakthroughs</b>		
	Available	69	54.8
	Not available	57	45.2
	<b>Total</b>	<b>126</b>	<b>100</b>

Table 1 shows the profile of behavioural research data collection methods. The table revealed that 39 (30.9%) of the respondents use conventional data collection methods only, 47 (37.3%) of the respondents use breakthrough methods only, and 40 (31.7%) use a combination of conventional and breakthroughs. The table also indicates that 107 (84.9%) of the respondents indicate that conventional methods as available as against 19 (15.1%) who indicated not available. 69 (54.8%) indicated that new breakthrough methods are available, as against 57 (45.2%) who indicated that they are not available. This is further presented in figure 1 below.



**Figure 1:** Availability of Conventional and Breakthroughs Research Data Collection Methods

Figure 1 shows the availability of conventional and breakthrough research data collection methods. The figure indicated that the conventional methods are more available than the breakthroughs, as indicated by the respondents. This result may be because the use of breakthroughs requires some level of technical know-how that not all researchers possess.

**Research question 2:** Is there any significant difference between conventional and breakthroughs in the perception of behavioural research data collection methods?

*Table 2: Mean difference of perception of conventional and breakthroughs methods*

Group	N	M	SD	t	Df	Sig
Conventional	39	12.39	1.86	1.690	85	.000
Breakthrough	47	17.63	2.11			

Table 2 shows the  $t(85) = 1.690$  is less than the p-value ( $p < 0.05$ ), and it is statistically significant. Hence there is a significant difference between conventional and breakthroughs in the perception of behavioural research data collection methods. Behavioural researchers differ in perception of data collection methods. The respondents perceive breakthrough methods as easier to use, interactive and helpful in data collection compared to conventional methods.

**Research question 3:** Is there any significant difference between conventional and breakthroughs in the challenges of behavioural research data collection methods?

*Table 3: Mean difference of challenges of conventional and breakthroughs methods*

Group	N	M	SD	T	Df	Sig
Conventional	39	9.36	3.21	4.820	85	.000
Breakthrough	47	7.22	1.90			

Table 3 shows the  $t(85) = 4.820$  is less than the p-value ( $p < 0.05$ ), and it is statistically significant. Hence, there is a significant difference between conventional and breakthroughs in the challenges of behavioural research data collection methods. Behavioural researchers differ in the challenges of data collection methods. The respondents encountered more challenges with the use and handling of breakthrough methods as sophisticated, technical, electricity and data-driven when taking data collection as compared to conventional methods.

**Research question 4:** Is there any significant difference between conventional and breakthroughs in prospects of behavioural research data collection methods?

*Table 4: Mean difference of prospects of conventional and breakthroughs methods*

Group	N	M	SD	T	Df	Sig
Conventional	39	6.16	1.01	3.610	85	.000
Breakthrough	47	9.22	1.90			

Table 3 shows the  $t(85) = 3.610$  is less than the p-value ( $p < 0.05$ ), and it is statistically significant. Hence, there is a significant difference between conventional and breakthroughs in prospects of behavioural research data collection methods. Behavioural researchers differ in the prospects of data collection methods. The respondents indicate positive prospects in terms of easy handling, adaptation to time and geographical location barriers of breakthrough methods as compared to conventional methods.

#### 4. Discussion of Findings

The result on the profile of behavioural research data collection methods revealed that there are more users of breakthroughs than the conventional and mixed methods of data collection. The conventional methods were found to be less available than the new breakthrough methods. These results may be because the world had just scaled through the pandemic, where many nations were

on lockdown, and researchers were supposed to move on to the continued advancement of knowledge for human development. The result of this study is in line with that of Simplilearn (2023), who found that there are several online tools used for data collection. Among them are survey monkey, qualtrics, google forms, telephone interviewing, survey planet and other data collection methods (Jinadu and Balogun, 2020; Cristobal-Fransi et al., 2020; Omodan, 2020; Jinadu et al., 2021; Simplilearn, 2023). It is important to spread awareness and the use of these tools to the public as it will significantly enhance the data collection process. These tools also make data analysis very easy for researchers, so proper training should be ensured. This result also tallies with that of Jinadu and Balogun (2020), who found the synchronous and asynchronous online learning platforms during the COVID-19 lockdown. It was reported that WhatsApp, telegrams, Skype, emails and others are helpful and can also be deployed to research data collection in addition to using them for teaching and learning.

The findings on the significant difference between conventional and breakthroughs in the perception of behavioural research data collection methods showed a significant difference between conventional and breakthroughs in the perception of behavioural research data collection methods. Behavioural researchers differ in perception of data collection methods in favour of breakthroughs. This finding may be because most researchers have enjoyed what the breakthroughs offered and the benefits accrued from collecting data for research through breakthrough methods. The finding of this research is in tune with that of Rapanta et al. (2020), who reported that there is no doubt COVID-19 pandemic has disrupted research, especially data collection. However, this has not led to a cessation of research, instead, online platforms were created to gather data through digital devices. With these new methods, researchers are still able to contribute knowledge. This led to the migration from the traditional method of data collection to the breakthrough methods. With these new methods, however, researchers were faced with technical issues, unavailability of the device, bad internet connection, power outage, and respondents not being exposed to the use of the new tools. Additionally, some researchers preferred interaction with the respondent as they may not take the remote seriously. The finding of this study is also in tune with that of Cristobal-Fransi et al. (2020), who found that the adoption of technology is perceived to be limited by certain factors such as funds, lack of social amenities and economic viability to sustain technological improvement.

The result on the significant difference between conventional and breakthroughs in challenges of behavioural research data collection methods revealed a significant difference between conventional and breakthroughs in challenges of behavioural research data collection methods. Behavioural researchers differ in the challenges of data collection methods. The result of this study corroborates that of Siemens (2004), who reported that technology addresses the issue of challenges that may beset the traditional methods of research data collection and appreciate the introduction of technology to overcome the challenges. The result of this study also agrees well with that of Omodan (2020), who found that the compulsory use of technology in rural universities by the stakeholders such as lecturers and students will enhance their knowledge and thereby make them aware of ICT trajectory, including that of use for research purposes.

The findings on the significant difference between conventional and breakthroughs in prospects of behavioural research data collection methods indicated a significant difference between conventional and breakthroughs in the prospects of behavioural research data collection methods. Behavioural researchers differ in prospects of data collection methods in favour of breakthroughs. This result may be because breakthrough methods require a source of power supply, technical know-how, and internet facilities, which may pose some challenges. This result may also be due to the fact that the available breakthrough methods have proved useful. Hence, good prospects for the future are reported in favour of breakthrough methods.

The result of this study is in tandem with that of Anderson et al. (2020), who reported that technology is advancing very fast, making it easy to gather other relevant information from anywhere in the world. This constant development has led researchers to expect information to be easier and more accessible. Tech companies and start-ups are learning that to be successful, data must be unified across the globe. They are also ensuring that the technology stack must be flexible enough to support different options ranging from offline data analysis to real-time machine learning. The results also support that of Siemens (2004), who reported that technology is a major part of the learning process and that our constant connectedness gives us opportunities to make choices about our learning, research inclusive. Breakthroughs are promoted outside the shore of an individual researcher, such as through social media, online networks, blogs or information databases.

## 5. Conclusion and Recommendations

The study established that there more users of breakthroughs than the conventional and mixed methods of data collection. The conventional methods were found to be less available than the new breakthrough methods. The study also established a significant difference between conventional and breakthroughs in perception, challenges, and prospects of behavioural research data collection methods, all in favour of breakthroughs. The study concluded that there are many available opportunities for research data collection in behavioural sciences with breakthroughs after Covid-19. Although many of these breakthroughs were yet to be discovered by some researchers, those discovered were still perceived to be too sophisticated, technical, electricity and internet-driven, although with promising futures in terms of usefulness. It is therefore recommended that behavioural researchers, as well as other researchers, avail themselves of the opportunities offered by the new breakthroughs to advance their research endeavours. Also, behavioural researchers should work with software developers, users, and other stakeholders to address the challenges of breakthrough methods of data collection in behavioural research.

## 6. Disclosure and Conflict of Interest

There are no conflicts of interest whatsoever.

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