Exploring new research approaches and ethical practices towards institutional policy in the new normal:
A literature review

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Abstract: *This article provides an overview of research methodologies and designs, sample techniques and approaches, research ethics, and strategies for assisting students with research in the new normal. Each strategy offers some advantages and disadvantages. In times of global health emergencies, virtual surveys surpassed traditional methods. Replacing survey respondents is a straightforward process. Web-based control systems provide rapid data export and real-time data access during the survey, therefore increasing the data quality. While traditional surveys need travel and time-consuming data entry, virtual surveys may capture location information via GPS, time stamps, and GIS-integrated data. They take less time to complete than traditional surveys. Participation in virtual surveys is difficult since it is difficult to incentivize responders. Participants who do not have a mobile phone or are not linked to a mobile network may also be charged for participation. Each method or design has an associated acceptable sampling strategy and ethical considerations that the researcher must consider. Experts recommended mixing virtual and face-to-face or paper-based modalities to increase those with restricted access to smartphones or mobile networks. Mobile applications are simple to use. Due to the constrained nature of responder involvement, instructions must be precise. During the survey, one may connect with respondents via chat platforms, SMS, or app-based alerts. Effective data collecting may help recruiters save time and money. Consider collaborating with organizations that can reach target populations through social media or with local research firms that have access to massive datasets. It will aid in the development of seamless interaction and will boost research productivity. Always maintain an awareness of participant privacy and interaction. If possible, express gratitude for the responders' time and urge them to participate, notably low-income respondents. Consider using survey participants' mobile data credits to cover their data consumption or negotiating with cell carriers to reduce or remove such charges. Allow sufficient time for the development of virtual tools. Verify that the tools are user-friendly and appropriate, especially if they are unfamiliar with virtual surveys.*

Keywords: *Educational research, methods and designs, sampling techniques, research ethics, institutional policy, new normal, literature review*

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INTRODUCTION

COVID-19 is causing havoc not just in everyday life but also in natural science. As institutions and colleges around the country become interactive, researchers are trying to preserve their subjects, scholarships, and futures (Clay, 2020). According to Zacks, studies that require placing groups of individuals together in proximity would be the first to be impacted. Universities are discontinuing all face-to-face research owing to the risks involved, citing risks to participants going to and inside laboratories and concerns to employees. While standard precautions protect researchers, personnel will continue to work even if the institution closes.

Accordingly, experts do not want to increase the likelihood of institutional expertise being locked up in the hands of a single person. They do not want anyone to feel compelled to come. For example, by educating other researchers on handling data, another team member may step in if someone falls unwell. Thus, frequent interaction is essential for keeping the study and the researcher's mental health in check. In addition to weekly Zoom meetings, researchers may be allowed to enquire about their problems and provide problem-solving support.

While it is disappointing not to gather data, this is an excellent opportunity to work on a paper, take an online course, or develop that research skills apositive attitudes towards it. According to Major and others, students, trainees, and early-career researchers are the most susceptible right now. As professors, they do everything they can to guarantee that they may continue to move toward their goals while remaining flexible about deadlines. Furthermore, because face-to-face instructions and conferences are likely to be canceled, look for other opportunities to network and build a professional profile by videoconferencing with peers.

Many students are anxious about how to conduct their research while the COVID-19 outbreak is in full swing. Many faculty advisors have expressed similar reservations. During the COVID-19 epidemic, students and teachers must collaborate to determine the best choices for fostering emotional student research experiences. The current editorial, together with previous materials and discussion, provides a good beginning point for evaluating the effects of the COVID-19 pandemic on research and formulating a strategy for proceeding with undergraduate and graduate student projects. The following

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recommendations are for moving undergraduate and graduate student research (Steven and Durocher, 2020). As a preliminary step, students and faculty advisers should discuss how the COVID-19 epidemic has changed the initially intended study. Another option is to "refine the issue and hypotheses." Students and faculty advisers should go over degree program requirements to determine how to manage their time and work toward the next most appropriate degree completion milestone. Graduate students, for example, may shift their focus to completing courses, preparing for qualifying tests, and writing an introduction.

While the current environment provides fresh research opportunities, it is necessary to evaluate how we will research these different conditions. Quantitative researchers that use secondary databases are less likely to be influenced by such computational constraints (Marhefka et al., 2020). It may be argued that qualitative researchers are more prone to be unhappy with their work. It is critical to note that qualitative research design consists of three distinct steps: site selection and sampling, data collection methods, and data analysis strategies (Ravitch, 2020). Working from home might give a more comfortable and relaxed environment than a typical office. Jowett (2020) urges researchers to be mindful of these stressors while speaking with potential study volunteers. Face-to-face encounters are prevalent in qualitative data gathering (Jowett, 2020), as they allow for data gathering through interviews, focus groups, and fieldwork (Ravitch, 2020). Online labeling approaches, on the other hand, are already well-established. Since social media has grown considerably over the last decade, researchers will utilize sites like LinkedIn and Twitter to identify and sample linked firms and individuals. Several technologies (such as Skype, Zoom, and WhatsApp) may be utilized to remove in-person contact practically. Participants may be unfamiliar with such technology, and unstable internet connections may make conducting interviews problematic.

While phone interviews may be necessary in some cases, video interactions via technologies such as Skype or Zoom provide the benefit of essentially matching a subject's discourse during an in-person interview. Video experiences can boost levels of engagement since they excite both the aural and visual senses (Marhefka et al., 2020). In essence, video and phone conversations are a substitute for face-to-face in-person questioning. They have several advantages, including the removal of travel costs, the capacity to collect data more rapidly, and the opportunity to conduct interviews with respondents all over the world without the worry of pandemic-related limits.

Methodological guidance on conducting interviews in a simulated environment is also offered (Geisen, 2020; Jowett, 2020; Ravitch, 2020). According to DeHart (2020), ethnographic analysis is still possible if three factors are considered: the study's subject and location. However, although the techniques focus on how qualitative researchers could combine existing projects or new research programs in the future, secondary data still provides many resources (Jamieson, 2020). Institutions are frequently able to obtain qualitative evidence through research interviews and focus groups. A lot of this data comes from peer-reviewed, financed, and finished research, and it is anonymized and quality-assured for reuse. Archival data processing is very beneficial for postgraduate students with little expertise. Using secondary qualitative data repositories is less expensive in terms of legal costs and will increase the legitimacy of student work (Jowett, 2020).

However, using deposited data is only one type of secondary qualitative study; there is an abundance of potential qualitative data to be obtained. Print and broadcast media, for example, maybe utilized to investigate societal representations on a wide range of issues. Some social scientists have also conducted secondary qualitative reviews of textbooks, blogs, speeches, and debates. Using these data sources allows researchers to focus on real societal concerns rather than collecting data for a potentially irrelevant study. To recapitulate, because of time constraints and social distance, in-person research may be one of the last areas of academia to normalize (Wood, 2020).

Furthermore, the nature and scope of prohibitions vary per nation. As a result, a researcher's decision to begin or resume field research should be affected by their organization and the advice of suitable specialists. However, the epidemic does not exclude fieldwork, and more specifically, interviews. Technology has altered daily life. It also provides an opportunity to modify existing data-gathering processes. While some academics continue to rely heavily on such platforms for data collecting, the current scenario may encourage the adoption of more innovative methods to science, such as secondary qualitative research employing data that has already been collected. According to Steven and Durocher (2020), the COVID—19 pandemic has impacted undergraduate and graduate student research. Because of the present uncertainty, teachers cannot provide clear direction on how students might proceed with their studies and capstone projects.

As a result, research methods and designs, sampling methods and approaches, research ethics, and tactics for helping students with research in the new normal are addressed in this article.

METHODOLOGY

This study used a literature review method. All studies relied on literature reviews. They can help build knowledge, provide policy and practice suggestions, demonstrate an effect, and perhaps provide new ideas and approaches for a subject. Reviews of literature must be studied and evaluated like empirical reports. According to Palmatier et al. (2018), a good literature review has depth and rigor; it is more than a list of previous studies.

They also claimed that a successful literature review must be reproducible, meaning that an external reader can replicate the study and reach the same findings. A literature review should benefit both scholars and practitioners. It utilized a stand-alone review. Finding relevant publications (such as books and journal articles), critically examining them, and describing your findings are all part of writing a literature review. There were five essential phases: (1) Look for pertinent publications, (2) Sources should be evaluated, (3) Determine the themes, disputes, and gaps, (4) Create a structure, and (5) Make a review of the literature. If one is writing a separate publication, they may address the broad implications of the literature or give recommendations for future studies based on the gaps they have observed and analyzed.

DISCUSSION

1. Research methods and designs in the new normal. The pandemic has disrupted fieldwork with local contacts, whether survey enumerators or local groups. In the meanwhile, corporations are reacting with guidelines, blogs, and other forms of contemplation. It is possible to research "with" the Internet (adapting offline procedures), "in" the Internet (researching online interactions), or even "on" the Internet (researching online interactions) (adopting online research as a topic for research). Ethics must always be addressed regardless of the researcher's study approach. Table 1 depicts the many qualitative research techniques and designs that might be used in the new normal.

1.1 Qualitative research approaches. *Ethnography online* as synonyms for ethnography, cyber-ethnography, online ethnography, and virtual ethnography has been tackled from various perspectives. Christine Hine originated the phrase 'virtual ethnography,' Robert Kozinets came up with the term 'netnography,' and 'digital ethnography' is also a general word. Cyber-ethnography is sometimes referred to as virtual ethnography, digital ethnography. Most frequently, online ethnography is a kind of online research that uses ethnographic methods to investigate communities and cultures established through computer-mediated social interaction. *Literary anthropology*. Fiction is anchored in historical and socio-cultural settings, from folktales to literary essays, short stories, and online narratives. It frequently provides 'a rich source of knowledge about civilizations that may or cannot be studied using standard ethnographic approaches' (Cohen, 2013). Literary anthropology may be utilized for several reasons, including historical ethnography and current studies. *Structured, semi-structured, or unstructured online interviews* can be synchronous or asynchronous, with or without visual help. Dowling et al. (2015) provide an overview of how various approaches (social media, mobile approaches) might 'enrich' the interview as a starting point. *Focus groups* have successfully been converted online and are now commonly utilized in market research. These materials include methodological issues as well as examples of application in various research fields. Nathan Browning provides helpful advice on how to set up online focus groups in Lupton (2020). *Mobile techniques* record social life "as it happens" (Dowling et al. 2015), and app-based approaches may help academics obtain data concurrent with the social interactions being studied. Mobile technology and the tracking of fish (and fisherman) have opened vast opportunities in the maritime realm. *Diaries* can be structured (like a questionnaire) and geared toward quantitative analysis, or semi-structured or unstructured, allowing for more spontaneous reflection. Maintaining contact with participants is critical, especially for longer-term research, ensuring participation. Depending on the study, diaries might be used for months or hours. They can employ interval sampling (every hour or day) or event sampling (every hour or day) (jot down something unusual that happens). Examine the participants and what they would find simple to use (ask them) and what you would be able to analyze inside the analytical technique you have picked (Lupton 2020). Smartphones can help collect data for various approaches, including asynchronous interviews, mobile approaches, and diaries for *photo/video/voice elicitation. G*etting people to discuss images or produce images as data are just a few of the options. The confluence of all these materials results in a co-created 'field event' (Ahlin & Li, 2019). Participants may be asked to take videos of their every day activities by researchers who monitor them. They may be requested to record videos and send them to the researcher. *Videos of ordinary routines* can also be utilized to highlight the researcher's autoethnographic activity. *Story completion* is a qualitative methodology that has been chiefly utilized in developmental

psychology but can be employed in other areas of study (Clarke et al., 2019).

Table 1

Qualitative research approaches and design in the new normal

Qualitative Approaches	Descriptions
Cyber-ethnography/ Netnography	Cyber-ethnography uses anthropological methodologies to examine online communities and cultures. It is sometimes called online ethnography, digital ethnography, or virtual ethnography. There is no defined method for adapting ethnography to the internet environment.
Literary Anthropology	Fiction is a rich source of knowledge about civilizations that may or cannot be studied using standard ethnographic approaches. Literary anthropology may be utilized for several reasons, including historical ethnography, current studies.
Interviews	Structured, semi-structured, and unstructured online interviews can be conducted synchronously or asynchronously, with or without visual assistance. Dowling et al. (2015) present an overview of how various techniques (social media, mobile techniques) might be used to "enrich" the interview as a starting point.
Focus Groups	Focus groups have been successfully translated to the Internet and are now widely used in market research. These materials include methodological issues as well as examples of application in public health and environmental research.
Mobile Methods	Mobile tools capture social life "as it happens," and app-based approaches may assist academics in collecting data that is contemporaneous with the social interactions being investigated. Mobile technology and the tracking of fish (and fisherman) have created many new options in the nautical arena.
Diaries	Diaries can be used for months or hours, depending on the research. They can be written, spoken, collaged, or photo-based. It is vital to consider the participants' needs.
Photo/Video/ Voice Elicitation	Smartphones can aid with asynchronous interviews, mobile methods, and diary data collection. Options include having individuals debate visuals or create images as

	data. The resulting 'field event' is co-created.
Videos for Ethnography, Auto-ethnographic, or Bio-logging (of the self and others)	Researchers may ask participants to record films of their regular activities and share them with the researcher. Simple videos can also be utilized to highlight the researcher's autoethnographic activity.
Story Completion	Story completion is a qualitative approach used in developmental psychology. The method uses story stems,' in which a fictional character is presented and faced with a dilemma. The contestants must finish the story.
Auto- and duo-ethnography	In auto- and duo-ethnography, the researcher is examined. From re-enactment movies (with or without wearable cameras) to app-based solutions, data gathering can heal memory and experience.
Arts-based research	Other genres of art, in addition to the literary, ethnographic approaches outlined above, can be practical tools for qualitative researchers seeking evidence from social interactions.

The method uses tale stems, in which a fictional character is presented and frequently confronted with a dilemma. The contestants must finish the story. The final narratives are then analyzed to discover what they reveal about the story's substance (Lupton 2020). *Formalized adverbial adverb*. Data may be recorded, transmitted, and evaluated using digital technology. In *auto- and duo-ethnography*, The researcher is investigated. From re-enactment movies (with or without wearable cameras) to app-based solutions, data collecting can help memory and experience work. Aside from the literary and ethnographic methodologies, other art-based research may collect data from social interactions.

1.2 Semi-quantitative and Quantitative Research Approaches. Table 2 exposes the possible semi-quantitative and quantitative research approaches and designs in the new normal. *Online and phone survey* software is widely established. Many surveys still use a combination of online, phone, and in-person data gathering methods. Without F2F data cooperation, unequal access to IT infrastructure can lead to substantial non-response, attrition, or under-coverage concerns. *Digital methods* are a 'native' digital mixed method that focuses on storing and organizing digital data. In 2007, the concept of digital methods was proposed as a counterweight to virtual methods, which intended to apply the social scientific instrumentation to digital research (Rogers, 2009).

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Table 2

Semi-quantitative and quantitative research approaches and design in the new normal

Semi-quantitative and Quantitative Research Approaches	Descriptions
Online and Phone Surveys	Even though online survey software is well established, with both free and commercial choices available, many surveys still use a combination of Internet, phone, and face-to-face collecting methods. Uneven access to IT infrastructure can lead to significant non-response, attrition, or under-coverage issues.
Digital Methods	Digital methods are a 'native' digital mixed method that focuses on storing and organizing digital data. In 2007, the concept of digital methods was proposed as a counterweight to virtual methods.
Big Data	The social sciences – and other fields — are interested in practical data approaches because they can handle far more huge data sets than the cases being studied. Big data approaches aim to find stable and potentially complex clusters and predictions in data without relying on chance. Big data approaches include data mining, social media analysis, content analysis, and geography analysis.
Content Analysis	The ability to find patterns and common themes through semi-quantitative or quantitative analysis of texts and multimodal materials has dramatically increased. The availability of large datasets on the Internet and enhanced software tools have aided in the refinement of this method, commonly used in communication studies.
Social Media Analysis	Many social media platforms have collected data about interactions inside and between groups and academic research participants. Each type of data analysis has its advantages and disadvantages.
Spatial Analysis	In fields like ocean and coastal planning, climate change adaptation, and ecosystem services, geographic data collecting technologies such as GIS (Geographic Information Systems) or geospatial data are frequently utilized. Studies of complex socio-ecological systems use it.
Social Network Analysis	Social network studies use graph analysis to quantify and characterize the connections between social actors and activities to explain the characteristics of these interactions, detect patterns, and explain social behavior. Email surveys may be used to gather information for social studies.
Social Simulation	Computational social sciences have used social simulation modeling to analyze policy. Agent-based modeling (ABM) is one of the numerous techniques used to investigate complex crises and emergencies.
Expert Elicitation	Expert assessment is defined as "the facilitation of quantitative expression of subjective judgment, whether on questions of fact or value," and it is widely used to assist policy choices in difficult situations "where current data and models cannot supply critical information." This method can collect data in person or by email, and it can be used with other methods.

Virtual methods were considered to be digitizing existing research procedures (online surveys or online ethnography). Digital techniques, rooted in media studies and the so-called computational revolution in the humanities and social sciences, attempted to learn from the medium's methodologies and repurpose them for social and cultural research (Venturini & Bounegro 2018). *Big data* approaches appeal to social sciences because they can cope with much larger data sets than the investigated cases. Big data approaches seek to find persistent and complex clusters and predictions in data without relying on chance (Oswald & Putka, 2017). *Big data* approaches include data mining, social media analysis, content analysis, and geography analysis. Chen (2018) presents an overview of the various techniques and uses, with examples drawn from a special issue of Sociology released in 2017. *Content analysis*, texts, and multimodal resources to find patterns and themes have expanded in recent years. It has been enhanced by the availability of large internet datasets and improved software tools.

Many academic researchers and groups use social media to collect data on interactions within or between groups in a *social media analysis*. These data can be analyzed quantitatively or qualitatively. GIS (Geographic Information Systems) and geospatial data have been widely used to investigate social-ecological systems, such as AIS (Automated Information Systems) for boats (Dailianis et al., 2018). *Spatial analysis* is also used to investigate complicated socio-ecological systems (McDermott et al., 2019; McDermott et al., 2018 & Hanich et al., 2018). *Social network analyses* utilize graph analytical tools to

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measure and characterize the relationships between social actors and activities to explain social behavior in marine planning, seafood trading, and climate change adaptation. Email surveys, as used by Smythe (2017), can be used to collect data for social analysis. *Social simulation* modeling is utilized in policy analysis in the computational social sciences. Agent-based modeling (ABM) is one of the many methods used to investigate complex crises and emergencies. "*Expert elicitation*" is "the quantitative expression of subjective judgment on truth or value." (Dias et al. 2018), and it is widely used to support policy decisions in ambiguous contexts (Colson & Cooke 2018). (Morgan, 2014). This approach can gather data in person (as in Singh et al., 2017) or by email (Singh et al., 2019), and it may be integrated with other approaches such as (social) network analysis.

1.3 Virtual surveys. Data collection is possible despite COVID-19 travel and social restrictions. Unmanned aerial vehicles (UAVs) are used to collect primary data in virtual surveys. Virtual surveys are used (Asian Development Bank, 2021) to combat the coronavirus. It may be used to overcome distance and transit restrictions at any point of the project cycle. These surveys can be used for social and gender evaluations, indigenous peoples censuses and household surveys, public consultations, and technical assessments.

Table 3 exposes the various virtual survey approaches during the new normal. Virtual surveys include (Asian Development Bank, 2021): (1) *Computer-assisted telephone interviews (CATI)*. A remote interviewer chats with people and enters their answers into a computer. (2) *Computer-assisted web interviews (CAWI)*. A computer, tablet, or smartphone with an Internet connection is used to conduct an online survey. Web-based survey alternatives include Google Forms, Survey Monkey, Typeform, and SurveyGizmo.However, it requires mobile equipment and survey workers on-site. (3) *Computer-assisted personal interviewing (CAPI)*. Interviewers collect data on tablets or phones and upload it to a survey management website. (4) *Social media surveys*. Sites like Facebook, LinkedIn, Twitter, and WeChat collect data. (5) *Virtual focus-group discussion*. Participants are brought together for an organized conversation via video conferencing and chat platforms. Zoom, Google Meet, Skype, and Microsoft Teams are some of the platforms available. (6) *Text message survey*. Text messages are used to provide polls, voting opportunities, and survey links. SMS is a feasible alternative because of rising mobile phone usage, especially in rural areas.

Table 3

Virtual survey approaches in the new normal

Virtual survey approaches	Descriptions
Computer-assisted telephone interviews (CATI)	A remote interviewer talks with respondents and inputs their replies into a computerized questionnaire
Computer-assisted web interviews (CAWI)	Data is gathered by online questionnaires administered via a web interface. Respondents complete the survey using their computer, tablet, or smartphone. Google Forms, Survey Monkey, Typeform, and SurveyGizmo are some market alternatives for web-based surveys.
Computer-assisted personal interviewing (CAPI)	Data is collected by interviewers utilizing tablets or mobile phones, then transmitted to a survey administration website.
Social media surveys	Data is gathered via sites such as Facebook, LinkedIn, Twitter, and WeChat.
Virtual focus-group discussion	Participants are brought together for an organized conversation via video conferencing and chat platforms. Zoom, Google Meet, Skype, and Microsoft Teams are some of the platforms available.
Text message survey	Text messages are used to provide polls, voting opportunities, and survey links. SMS is a feasible alternative because of rising mobile phone usage, especially in rural areas.
Mobile applications	Respondents access the survey by downloading a custom-made application and entering their log-in credentials.
Mixed method virtual survey	A combination of virtual and face-to-face methods is used to collect data.

However, most SMS surveys are one-way. Frontline SMS enables two-way communication even in areas without the Internet. (7) *Mobile applications*. Respondents access the survey by downloading a custom-made application and entering their log-in credentials. (8) *Mixed method virtual survey*. Various virtual survey methods or a combination of virtual and face-to-face procedures are used to collect data.

2. The sampling methods and approaches in the new normal. Surveying or collecting data from a subset of a broader population is called sampling. Web and email surveys are two types of internet-based survey sample methodologies. Traditional surveys are sent by mail or phone rather than being completed online. A population can be sampled in a variety of

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ways. The sample's results are "representative" of the population as a whole (Fricker, 2021).

Coverage errors arise when a portion of the population is excluded from the sample. To be more specific, Groves outlines three distinct populations: (1) The group the researcher expects to conclude is referred to as the population of inference. (2) The target population is the population of inferences minus the various categories that the researcher has chosen to exclude. (3) The frame population is a subset of the overall target population defined, identified, and accessed using survey materials or equipment (Wright and Tsao, 2004). The survey sample is taken from the sampling frame population, and coverage error is the difference between the frame population and the inference population. Post-stratifying includes weighting the survey sample to match the inferred population on certain important observable features.

Sampling error arises when a target population sample is taken. It is since various samples provide varied survey data. In general, increasing the sample size reduces sampling error when assuming a random sample. *Non-response errors* of whole respondents or specific survey items (item non-response). Groves calls non-response an "error of non-observation" (1989). The response rate is commonly used to assess the generalizability of survey data. *Measurement error* transpires when the survey reply changes from the "actual" answer. For example, respondents may not answer sensitive questions honestly or misinterpret or make errors in their replies. Thorough testing, survey instrument and question update, and survey modality selection all decrease measurement error.

There are two forms of survey sampling: probability-based sampling (sometimes known as "random sampling") and non-probability sampling. A probability-based sample is one where the respondents are picked randomly. The probability that each member of the frame population was chosen is known. The sample probabilities do not have to be identical.

2.1 Types of probability sampling. Table 4 lists the types of probability sampling.

Simple random sampling (SRS) is a selection strategy that gives an equal chance to two groups of equal size. Simple random sampling mathematically selects n units from a population of size N with equal probability. *Stratified random sampling* is when the population is made up of numerous homogenous groups, this method comes in handy. Some situations require stratifying the population into homogeneous groups before taking SRS samples from each category. *Cluster sampling* is a collection or cluster of separate components. This rule applies. Sometimes it is better or more convenient to sample Internet users by

discussion groups or Internet domains than by individual users inside those groups or domains.

Systematic sampling is picking every kth element from a sample frame or a list of possible responses. The advantage of systematic sampling is that no sampling frame is required beforehand. For Internet surveys, systematic sampling may be employed to sample repeat visitors. If the sampling interval does not match the sampled sequence and a random starting point is chosen, the sample is a probability sample.

Table 4

Types of probability sampling

Types of Probability Sampling	Descriptions
Simple Random Sampling (SRS)	Any two groups of equivalent size within a population have an equal chance of being picked using this technique. Random sampling picks n units at random from a population of size N, ensuring that any sample at that size has an equal probability of being chosen.
Stratified Random Sampling	This approach is appropriate when the population consists of several distinct but related subgroups. Before employing SRS, stratifying the population into homogenous groups may be more feasible or statistically beneficial in some cases (or both).
Cluster Sampling	When a sample unit is a collection of individual units, this rule applies. For example, in surveys of Internet users, it may be beneficial or simple to sample first from discussion groups or Internet domains and then from individuals within the groups or domains themselves.
Systematic Sampling	A sampling frame, or a stream of potential responses, is selected to choose every kth element in that frame. Systematic sampling has the advantage of not requiring a sample frame in advance. Systematic sampling can be used, for example, in Internet surveys to sample successive site visitors. The sequence is broken if the sample interval does not fit the pattern.

Non-probability samples emerge when the likelihood of every unit or respondent is included in the sample cannot be estimated or when everyone is free to choose whether or not to participate. The surveyor selects the sample for probability sampling using a probabilistic technique, and the population has no input. They take less time and effort to construct and cost less, but they typically do not allow statistical inference. Non-probability samples, on the other hand, have many uses in research.

2.2 Types of non-probability sampling. Table 5 illustrates few examples of non-probability sampling.

Quota sampling. Only the survey researcher has the authority to set response quotas based on specified criteria for the intended number of people to be surveyed. Survey interviewers pick the actual respondents, and quotas bind them. Minor biases may creep into the sample selection process since survey interviewers pick the people who will participate in the survey.

Table 5

Common types of non-probability sampling

Types of Non-probability Sampling	Descriptions
Quota Sampling	Necessitates that only the survey researcher creates quotas for the desired number of respondents based on specific criteria. Survey interviewers, who must comply with quotas, are then in charge of selecting respondents. Because survey interviewers choose respondents, slight biases may enter the sample selection.
Snowball Sampling	Typical usage is when collecting enough respondents would be exceedingly difficult or prohibitively expensive using other methods because the desired sample characteristic is scarce (simple random sampling). When doing a snowball sample, additional respondents are recruited by making suggestions to those who participated initially. Even though this approach can significantly reduce search costs, it introduces bias into results by increasing the risk that a sample does not accurately reflect the sampled population.
Judgment Sampling	Sample selection at the researcher's discretion is referred to as convenience sampling. An Internet user community may be considered "representative" by a researcher even when the population of interest comprises everyone who uses the Internet. Judgment sampling, which does not rely on a random sample, can be used in less systematic methods.

Snowball sampling is commonly used when finding enough people to fill a sample would be impossible or excessively expensive using other methods (simple random sampling). Snowball sampling is based on the suggestions of the initial responders to create new people who will take part in the sample. However, while this technique might save money on the search, it also adds bias. It enhances the possibility that the sample does not accurately reflect the population as a whole.

Judgment sampling is a type of convenience sampling where the researcher selects the sample at will. While the population of interest may include all Internet users, a researcher may collect a random sample from one "representative" Internet user group. Without random sampling, judgment sampling can be utilized in less structured techniques.

2.3 The methodology of a web survey. Table 6 shows how an online survey's methodology must be done concerning its purpose and claims. It is unacceptable to laud or condemn a whole survey data collection procedure based on a single implementation (Couper, 2000). The fact that a method cannot be generalized outside the sample implies that the methods and data are irrelevant in other research contexts. Like Couper (2000), the most prevalent are probability and nonprobability sampling methods. Web and email surveys can use list-based sample frames. Almost all email entertainment polls utilize online surveys.

Internet surveys use the same *list-based sampling frame* as traditional surveys. In this situation, essential random sampling is easy to execute and requires only contact information (typically an email address for an online poll). To quantify and perhaps adjust for non-response consequences, more information about each unit in the sample frame is required. While Internet-based surveys using list-based sample frames can be done through the web or email, the request to participate must be delivered via email. Since exhaustive population email lists are rarely accessible, big homogenous groups can be sampled (for example, universities, government organizations, large corporations). "High-coverage list-based sampling," says Couper (2000). Other random sampling methods do not need the enumeration of a sampling frame. Random digit dialing (RDD) is a *non-list-based random sampling* technique used chiefly for telephone surveys. There is no RDD equivalent for online questionnaires. For example, randomizing email addresses is impossible.

So, except for intercept surveys, non-list-based random sample Internet polls rely on traditional methods like RDD to contact potential respondents, adding to the complications and costs. Some surveyors must either filter potential respondents for Internet access or deliver a survey with several answer alternatives. Surveys with several answer modes add to fielding complexity and possible mode effects. A website or web page's visitors are randomly selected for *online intercept surveys*. These surveys tend to be most beneficial for marketing or customer satisfaction. This type of systematic sampling can provide data generalized to specific demographics, such as website/page visitors. The surveys may be restricted to

visitors with specific IP addresses, allowing for more targeted marketing, and cookies can prevent survey submissions from the same machine. This type of poll is susceptible to non-response.

Table 6

The methodology of a web survey

Sampling method	Web	E-mail
Probability-based		
1) Surveys using a list-based sampling frame	✓	✓
2) Surveys using non-list-based random sampling	✓	✓
3) Intercept (pop-up) surveys	✓	
4) Mixed-mode surveys with Internet-based option	✓	✓
5) Pre-recruited panel surveys	✓	✓
Non-probability		
1) Entertainment polls	✓	
2) Unrestricted self-selected surveys	✓	
3) Surveys using 'harvested' email lists (and data)	✓	✓
4) Surveys using volunteer (opt-in) panels	✓	

According to Coomly (2000), typical response rates vary from 15 to 30 percent, with the lowest response rates for poorly targeted and poorly structured surveys. The commercial brand being polled for surveys relevant to the individual in specific survey questions or marketing surveys received the most significant response rates. Participants in *pre-recruited panels* have agreed to engage in a series of surveys. For Internet-based surveys that require probability samples, these people are frequently recruited by phone or mail rather than the web or email. Researchers used questionnaires as part of a long-term project. Several companies have pre-selected panels of people from whom researchers might draw sub-samples for smaller projects or single surveys. For example, Knowledge Networks recruits all panelists via RDD and provides equipment and Internet access to those who need it. Pre-recruited Internet-enabled panels can offer Internet-based survey speed without the lengthy recruitment process.

Consequently, they may be a good alternative for researchers who wish to conduct an online survey yet need a sample that can be generalized. Using pre-selected panels has numerous drawbacks. A phenomenon called "panel conditioning" or "time-in-sample bias" occurs when long-term panel members answer differently to surveys than newcomers. It is also possible to lose a large number of potential

respondents throughout the recruitment and participation stages.

"In concept at least, this technique begins with a probability sample of the entire (telephone) population, and assuming no non-response error enables inference to the population," says Couper (2000). Internet-based *entertainment polls* are essential "surveys" performed only for the sake of amusement. Most of them are websites where visitors can respond to a postal survey. The Weekly Web Survey is an online entertainment survey. "Call-in polls (or text polls) allow viewers to vote for their favorite contestant or character by telephone. In reality, online entertainment polls are as unscientific as phone polls. *Harvested email lists* are made up of people contacted for their email addresses (knowingly or unintentionally). Many commercial firms (referred to as "email brokers") sell or rent email address lists. Lists can be made using web resources. Using the Yahoo! People Search, anybody may create lists of Yahoo email account holders by name or region. A name-based email search feature may assist.

Nevertheless, reminders, gathering email addresses, and sending unsolicited emails connected to surveys may be unlawful. *Unrestricted self-selected surveys,* like entertainment polls, are open to the public. They can be uploaded to a website for anybody to complete. They may be advertised online via website banners or in print and broadcast media. This type of survey has no restrictions on who can participate, and it is up to the participant to decide whether or not to participate (*opt-in*). Unrestricted, self-selected surveys use convenience sampling, and their results cannot be generalized. As shown by Berson et al., this does not exclude their use in research. The web can also help reach people who are hard to reach because they are hard to identify, locate, or exist in such small numbers that probability-based sampling is unlikely to reach them. *Volunteer (opt-in) panels* are similar to pre-recruited panels, except that participants are not recruited randomly. *Volunteer panels* are similar to unrestricted, self-selected surveys, except that participants opt-in to do a series of questions. These panels are often used for market research, soliciting customer feedback on commercial products, and members may be paid.

3. Research ethics in the new normal. Table 7 elucidates the ethical issues to consider when conducting survey research. Ideas on what is ethically correct or flawed are referred to as ethics. There is no general agreement on where the boundary between ethical and immoral action should be drawn — after all, everyone is different. However, there are some domains where ethical best practices are widely

established, particularly in enterprises that deal with the public or their workers (Fisher, 2020).

Table 7
Ethical issues to consider when conducting survey research

Ethical Issues	Characteristics
Confidentiality	It is critical to maintaining the highest level of confidentiality. By promising secrecy yet failing to retain and handle the information supplied by participants adequately, a researcher has betrayed the confidence of those individuals.
Informed Consent	If informed consent is not obtained, a participant may agree to complete a survey without fully knowing why it is being conducted or what will be done with the information they submit in the survey.
Anonymity	No matter how well-intentioned a researcher may be, it is unethical to keep personally identifiable information in a way that others may access or to fail to separate such information from survey replies properly.
Persuasion and Pressure	Participant pressure, persuasion, or coercion in a survey raises ethical issues in research.
Failure to Disclose Interest	Sponsors subsidizing the study should be aware of any interest in understanding the results in context by regularly publishing survey results. Consider, for example, that a company financed a study on the impact of a specific technology on sleep quality. As a result, this information should be made available to the public wherever the findings are released.

It is customary for human research ethics committees to require that researchers submit modification requests and approvals for face-to-face procedures that have already been approved. During a pandemic, researchers must examine "affective atmospheres" that disrupt normal activities. Many individuals are concerned, unwell, or caring for family ones who are ailing. Other family members may bully, abuse, or keep an eye on them. Privacy concerns must be addressed. Those who are more restricted, bored, or restless but in good health may welcome participating in research. Consider the intended participation group. Finally, using online data collection methods that connect to past data must be carefully evaluated ethically.

Obtaining ethical information and following ethical best practices has never been easier. With online survey software, a researcher can quickly define the objectives and obtain informed permission with a single click. When generating a new survey, colleagues may quickly evaluate the question wording and order, as well as the introductory statement.

By storing survey data on a safe, centralized site, a powerful survey engine can meet the ethical requirements for security and confidentiality. Once the findings come in, the data may be cleaned, processed, and statistically analyzed in the same secure environment. Most modern survey software makes it easy to communicate results via automated reports that quickly change or update when new findings arise.

As a brief guide to online survey research ethics, consider the following: (1) For any research, the researcher should provide participants a summary of the study, including any dangers to them, a privacy statement, and an indication of the questions asked and their sensitivity. If the subject of the study is delicate, participants should be provided with a phone number to contact if they have any questions. (2) Participants may not be familiar with the researcher's computer-based procedures. Therefore the researcher should explain them clearly while protecting respondents' confidentially. (3) Researchers should allow participants to skip questions or leave the study if necessary to reduce the risk of psychological harm. (4) Unintentional skips are standard in surveys. Before completing the form or advancing to the next page, some online surveys demand that participants answer all questions thoroughly. Rather than making respondents answer every question, offer a response option for each one so they can skip the one they do not want to answer. (5) Add a link to allow respondents to opt-out of the survey on each page of the online questionnaire. Delete all responses from that subject if the respondent chooses this option. (6) In some instances, people are concerned that their replies to an online survey, including their email address and IP address, might be used to track them down in the future. Responders should be reassured that their information will not be collected unless they voluntarily submit it. (7) Respondents' email addresses should be stored in a separate file if the researcher asks for sensitive information and seeks them for whatever reason. The specific responses of a responder cannot be linked to their email address. (8) Give participants a clear understanding of the differences between anonymity and confidentiality and the implications of each (Fisher, 2020).

4. Tactics for helping students with research in the new normal. A list of techniques for undergraduate and graduate students and faculty advisers is shown in Table 8 to help students advance their studies.

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4.1 Research-Focused Projects: *Meta-analysis and systematic evaluation*. Students may expand on their literature searches by doing a systematic examination and meta-analysis. A more targeted inquiry can be asked without collecting data, resulting in new and more significant facts. *A focused study of the literature*. Students can also submit a revised version of their literature chapter to a peer-reviewed journal for publication. *Novel methodology or a scientific note*. Students working on new methods should shift their attention to describing how these new approaches may help with data collection and measurement and better understand the research area.

Table 8

Tactics for helping students with research in the new normal

Tactics	Characteristics
Research-Focused Projects	
Meta-analysis and systematic evaluation	Students might broaden their literature searches by doing a systematic review and meta-analysis. It enables a more targeted query to be asked without the requirement for laboratory data gathering, yielding new higher-level facts.
A focused study of the literature	Students may also choose to submit their study of literature chapter to a peer-reviewed publication when they have completed it.
A novel methodology or a scientific note	For students working on projects that employ innovative approaches, the emphasis should be shifted to explaining how these unique methods may facilitate data gathering and measurement and increased knowledge of the study issue in question.
Data that has already been obtained is analyzed	After reading past studies, students might inquire about how theory differs dependent on another variable. These inquiries and post-hoc testing will allow researchers to explore new ideas while using existing data as a base.
Computer simulation and mathematical modeling	Students can use data to construct mathematical models and simulations that explain and predict elements of variables. Modeling may be done in Excel or MATLAB.
Data mining	Students may use online databases to find new trends in massive data to identify trends, predict results, and infer hypotheses for further research.
Limited contact/remote human subject research	In specific human subjects research, noninvasive technology, questionnaires, or both may be employed. Students may interview a single subject, advocate a home-based intervention, or use questionnaires and noninvasive equipment to collect data for a case study.
Grant proposal	The criteria might be used to create an application for an external grant. Professional groups and foundations also offer scholarships and awards to undergraduate and graduate students, post-doctoral fellows, and early-career professors.
Teaching-focused research	Students can obtain unique teaching experiences and conduct educational research in various forms, including face-to-face, online, hybrid, and remote.
Capstone-Focused Projects	
Outreach and public engagement	Being able to convey scientific knowledge to laypeople is an integral part of conducting science. Students can choose to disseminate their project through forums, teaching, blogs, podcasts, or local newspapers. Another choice is to create an infographic that will help convey key details more engagingly.
Aligning scholarly activity with COVID-19	This initiative might address parts of COVID-19 and its impact on health, as stated in a recent editorial and call to action. Students might also broaden their emphasis and contribute to the reaction to COVID-19.
Historical perspective	Students might go in a new direction by focusing on the history of a particular feature. It is impossible to keep track of all the old historical documents.

Data that has already been obtained is analyzed. Students might go back to prior research and ask clarifying questions to understand better how ideas change based on gender and age. Such inquiries and post-hoc tests will enable researchers to test fresh hypotheses simultaneously utilizing current data as preliminary information. *Computer simulation and mathematical modeling*. Students may use mathematical models and simulations to explain and forecast the characteristics of a variable based on current data to improve their understanding. Applications such as Excel and MATLAB, for example, can be used to do mathematical modeling tasks. The aid of a second faculty member who is knowledgeable

in this subject may be required by students. *Data mining*. Students may utilize online databases to discover new patterns in large data sets, forecast outcomes, and infer hypotheses for further study. Students can use online databases to identify new trends in massive data sets, predict results, and infer hypotheses for further research. *Limited contact/remote human subject research*. In particular human subjects research studies, noninvasive technology, questionnaires, or a mix of the two may be utilized in conjunction with one another. A smaller number of participants, such as a single participant for a case study, may be used to obtain data. Students may also advocate a home-based intervention or assess participant responses using questionnaires and noninvasive devices. *Grant proposal*. The criteria might be used to develop a grant proposal for an external funding source. Professional organizations and foundations also provide scholarships and prizes to undergraduate and graduate students, post-doctoral fellows, and early-career teachers, among other recipients. It might be a very beneficial training opportunity for graduate students preparing for fieldwork with current financial constraints. *Teaching-focused research*. A variety of options for students to obtain unique teaching experience and conduct an educational-based research project may be available to them, with instruction and learning offered in various forms, including face-to-face, online, hybrid, and remote formats. Graduate students must have teaching experience since it can assist them in enhancing their research abilities and increase their career chances.

4.2 Capstone-Focused Projects: *Outreach and public engagement*. Being able to convey scientific knowledge to laypeople is an integral part of conducting science. Students can choose to disseminate their project through forums, teaching, blogs, podcasts, or local newspapers. Another choice is to create an infographic that will help convey critical details more engagingly. *Aligning scholarly activity with COVID-19*. According to a recent editorial and call to action, students should consider adapting their project to address parts of COVID-19 and how it affects health somehow. Students can also widen their interests and contribute to the response to COVID-19 by broadening their focus in general. Student volunteers at our university, for example, are working with COVID-19 testing and contact tracking efforts. It is also important to note that these students provide an essential service to the university and the local community since testing and contact tracing would not be possible without their aid. *Historical perspective*. Students might take a creative approach by highlighting the history of a particular area of their

studies. There are a plethora of historical documents. Furthermore, this may be used to recognize past accomplishments by historically underrepresented groups, which would help further efforts to encourage diversity and inclusion in the workplace.

CONCLUSION

This paper briefly illustrated the research methods and designs, sampling methods and approaches, research ethics, and tactics for helping students with research in the new normal.

Each approach has benefits and drawbacks. Virtual surveys outperform traditional approaches in times of global health crises. Replacing survey respondents is simple. Quick data export and real-time access during the survey improve data quality. While traditional surveys require travel and lengthy data input, virtual surveys may collect location using GPS, time stamps, and GIS-integrated data. They can be completed in less time than traditional surveys. Participation in virtual surveys is challenging since it is challenging to give incentives to respondents. Participants may also be charged for participation if they do not have a mobile phone or are not connected to a mobile network. Every method or design, there is a corresponding appropriate sampling technique and ethical consideration that a researcher must consider.

Experts advised increasing participation of individuals with limited access to smartphones or mobile networks by combining virtual and face-to-face or paper-based modalities. Do not overcomplicate things. Only about 30 questions should be asked. Apps for mobile devices should be simple to use. Because responder engagement is restricted, instructions must be explicit. Using chat platforms, SMS, or app-based alerts can let one communicate with respondents during the survey. A good panel data collection may save time and money on recruiting. Consider collaborating with nearby organizations that can reach target populations through social media or local research companies with access to vast information databases. Take into account the number of people that participated in the survey as well as the results. As a result, interactions will be more smooth, and productivity will go up. Always be mindful of participant privacy and engagement. Try to be as kind as possible while dealing with the respondents, especially the low-income ones, and express gratitude for their time. Think about using survey participants' mobile data credits or negotiating with cell service providers to reduce or eliminate data use charges. Allow adequate time for the creation of virtual tools. Make sure the tools are user-friendly and appropriate, mainly if research participants are new to virtual surveys.

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