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The Expansion of Qualitative Research Methods in Innovation Policy Studies

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2 Member of POLISS: https://poliss.eu. *This project has received funding from the European's Union H2020 Research and Innovation Programme under Grant Agreement No 860887.*

ARTICLE INFO

Article History:
Received : 05 February 2022
Revised : 13 June 2022
Accepted : 23 June 2022
Available online : 15 July 2022

Authorship Contribution:
The author is the main contributor

Keywords:
Qualitative methods,
Ethnography,
Action research,
Innovation,
Policy studies

ABSTRACT

Qualitative methods still have a feasible place in contributing to innovation policy studies. Unfortunately, the case study approach that has been widely applied in innovation studies has not deeply involved the active participation of the research object. At the same time, their role is vital in innovation policy. Applying a semi-systematic literature review approach, I propose two essential qualitative methods to extend the well-established traditional qualitative methods. First, Ethnographic research often used in social science studies is promising when combined with interview and observation methods. Second, Action research can potentially have a more significant impact because it involves researchers in natural and detailed research phenomena. Complementing qualitative research designs with one or both methods can increase the data complexity. On the other hand, challenges may arise regarding resource adequacy, which the careful preparation of research designs can prevent. This paper contributes to enriching methodological skills in preparing comprehensive qualitative research. However, further empirical studies are needed to demonstrate the strength of this methodological approach, which may also be combined with systematic literature studies of both methods in the field of innovation policy and other disciplines.

I. INTRODUCTION

Innovation can be approached in different ways as Nelson & Nelson (2002) defines innovation in a narrow sense based on legal and economic theory, and Freeman (2013) and Freeman (1995) define innovation from the perspective of the relationship between innovation and organization. However, the multiple meanings that emerge from various perceptions of innovation, according to Lundvall2016), have one thing in common where innovation is a social science. In the definition of social science, the innovation system can be defined as a tool that focuses on the essential processes of innovation in the economy and the institutions involved in it. As innovation systems have been implemented at various levels, from regional to national and from economic

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DOI: 10.14203/STIPM.2021.322

clusters to economic sectors, each area will exhibit different phenomena, measured in different ways and therefore require different methodological approaches.

Innovation applies various disciplines and can also connect the actors who produce it (Guimón, 2013; OECD, 1997). Because the field is quite multidisciplinary, innovation opens up opportunities to apply different types of methodologies. Understanding innovation theory and the methods that accompanies innovation theory are two things that cannot be separated (Kaminski, 2011; Midgley & Lindhult, 2021). The methodology will answer its suitability for the research problem. However, although many methods can be applied to certain types of research questions, researchers should still be given a clear understanding of how research methods are used and how they can lead researchers to the desired research results. The application of different methods also allows researchers to obtain different results. Therefore, a reliable researcher must explain the logical and open reasons why he uses a particular research method and how he hopes for the results of research using that method.

Jungmann et al. (2015) stated that methodological limitations in innovation research resulted in the narrowing of theoretical and methodological resources in innovation studies. There are several shortcomings in the practice of innovation studies. The main thing is the limited scope of data collected, especially on participant observation techniques or in-depth interviews. This method limits other data, such as video, focus groups, or survey data. Mixed research designs that are more complex are rarely applied because the two methods mentioned above are more dominant in qualitative research designs. While the study of innovation is a complex phenomenon, there is an essential and urgent need to improve the methodological skills of young researchers in conducting innovation studies (Grimpe, 2017; Katz, 2016). Understanding and mastering various methodological skills can enhance the interpretation of comprehensive study results so that research can present accurate conclusions according to the planned research questions. Not only individuals and the research community will benefit from improving methodological skills but also stakeholders, including policymakers who want social and economic transformation as an innovation goal (Noya, 2011).

Some of the prominent papers in innovation policy studies, such as Cooke et al. (1997), Lundvall et al. (2002), Asheim & Coenen (2005), and Tödtling & Trippl (2005), generally use quantitative methods whose analysis results are more of a summary of case studies rather than presenting detailed data and methods used. It causes a lack of guidance when other scholars want to study this paper's research approaches and procedures. Nordling & Pugh (2019) stated that there is a large gap between the many advantages of qualitative methods and the lack of innovation policy papers that use qualitative methods. For example, participatory and action research methods well established in qualitative research are rarely used in innovation policy studies. These two methods are believed to be able to enrich the field of innovation policy studies and increase the impact of research. On the other hand, he also found a mutually beneficial relationship between qualitative and quantitative methods.

This paper aims to discuss two essential methods, ethnographic research and action research, as an extension of the well-established qualitative methods, which some experts have found to show advantages that can increase the impact of research on innovation policy studies. In addition, this paper also describes the possible obstacles faced in applying the two methods, whether used separately or in conjunction with well-established traditional qualitative methods. Using a standard literature review writing style, this paper reviews and emphasizes two qualitative methods proposed by Nordling & Pugh (2019) that could potentially be used as extensions of existing qualitative methods. In this paper, I do not intend to criticize other traditional qualitative or quantitative methods, which have been widely used in the study of innovation policy. I would technically like to offer young researchers to enhance their methodological abilities by complementing their research designs with one or two of the approaches discussed in this paper. By applying the semi-systematic literature review method, I started searching for documents related to innovation policy in the context of a qualitative methodological approach. I then carried out a simple bibliometric analysis to ascertain whether there is sufficient room to discuss innovation policy studies from a qualitative methodological perspective and whether this

paper has the potential to have a clear research impact in this area.

Next, by using the most relevant articles discussing innovation policy studies and their relationship to qualitative methods, I review the primary papers in a structured way. Firstly, I review the position of the qualitative methods in innovation policy studies. Secondly, I review the type of qualitative methods that have so far been widely used in innovation policy studies. This paper offers an advanced review of ethnographic and action research methods, extensions of established qualitative research methods (such as case studies). To complete the discussion, I also raised some challenges that may arise in applying these two methods to help guide future research.

The remaining structure of this paper is as follows: in the second section, I outline the main theoretical framework that discusses the position of qualitative methods in innovation policy studies and what methods have been used so far. In the third section, I describe the method dan technique of writing this literature review. In the fourth section, I discuss two extensions of qualitative methods and present some of the challenges that may arise in applying these extended methods. In the last section, I present the study's conclusions and limitations.

II. ANALYTICAL FRAMEWORK

Qualitative Methods in Innovation Policy Studies

The research question is the most critical step in designing a research design and methodology. Research questions also direct the researcher to determine what information and type of knowledge he is looking for and then answer. One way is to review existing papers or look at the research scholars out there have done and how they are doing it (Fink, 2019; Ratan et al., 2019; Sileyew, 2019; Snyder, 2019; Wilhelm & Kaunelis, 2005).

Some of the most prominent papers in innovation policy studies, such as Cooke et al. (1997), Lundvall et al. (2002), Asheim & Coenen (2005), and Tödtling & Trippl (2005), generally use quantitative methods. The analysis results presented also tend to be case study summaries rather than presenting the data and methods used in detail. This paper also often lacks guidance to young scholars or researchers regarding suggested research approaches or procedures for designing their research. Nordling & Pugh (2019) state there is a large gap between the many advantages possessed by qualitative methods and the few choices in innovation policy papers that use qualitative methods. Nordling & Pugh (2019) suggest that qualitative research used in innovation policy studies is more towards participatory research because it can enrich the field of innovation policy studies. Participatory approaches are well established in qualitative research but are rarely used in innovation policy studies. This paper also focuses on positioning qualitative research in innovation policy studies and finds mutually beneficial relationships between qualitative and quantitative methods. They compared several articles in sociology, geography, and anthropology. They then suggested participatory methods to innovation policy studies because this approach involves a more significant number of groups affected by innovation policies while at the same time also introducing action research to increase the research impact.

Incorporating qualitative methods in innovation policy research will deepen the study and broaden the impact because it is not only carried out "on society" but also "together with society". As stated by Bansal & Corley (2012), qualitative research approaches as very appropriate to answer research questions "why" and "how" and direct researchers to inductively build theories. Several characteristics characterize qualitative research, which aims to help increase understanding of various phenomena by being part of the research process—the first characteristic is characterized by its focus on process and meaning. Second, researchers are considered subjects who collect and analyze data. Third, the process is inductive and produces a very descriptive final product (Merriam & Tisdell, 2015). This kind of research approach is considered very suitable for innovation policy research.

The qualitative method applied in innovation research generally uses a case study approach through interviews or observing secondary data (case study). However, some primary data sources are rarely used, such as video data, focus groups, interview narratives, and panel survey

data (Baur, 2009; Fiedler & Posch, 2009; Knoblauch et al., 2006; Lyndon & Schupp, 2015). On the other side, qualitative methods are often combined with quantitative methods in innovation studies because of the case study approach used. For instance, several quantitative methods have been applied for a long time in innovation studies through Social Network Analysis (SNA) by Coleman et al. (1957) and uni-, bi- and multivariate statistics by Freeman (1995). Therefore, innovation policy studies need a methodological tool that can reach more resources to increase the results' credibility.

Nordling & Pugh (2019) analyzed paper texts such as Cooke et al. (1997), Lundvall et al. (2002), Asheim & Coenen (2005), and Tödtling & Trippl (2005) which are tend to summarize policy reports. According to him, those who apply qualitative studies often only focus on theoretical discussions (Aula & Harmaakorpi, 2008; Benneworth & Hospers, 2007; Pugh et al., 2016). Even though qualitative research's main purpose is to increase understanding of various social phenomena, it is very suitable for use in innovation studies. The social phenomenon is closely related to innovation studies because it focuses on people as innovation actors (MacKinnon et al., 2009; Storper, 2011). A qualitative approach can facilitate this condition by using the appropriate approach and methods to answer research questions.

There is a methodological deficiency in much empirical research of innovation studies, even from various scientific disciplines (Jungmann et al., 2015). With all those research quantities, there is still a lack of adequate understanding of the quality and basic mechanisms of innovation policy studies even though, in practice, a mixed approach is often used to deepen the empirical studies analysis. Mixed methods indeed allow researchers to answer more complex questions. Consequently, data triangulation is essential for bringing together multiple data sources (Yin, 2018). For this reason, a participatory approach is considered the most possible, especially with a bottom-up approach that involves participants' more profound research to obtain valuable and relevant results for the group.

Case Study in Innovation Policy Studies

Case studies are the most common approach used in innovation policy studies. Interview, document analysis, and observation methods have been famous recently and are widely considered helpful for various social science studies (De Massis & Kotlar, 2014; Eisenhardt et al., 2010; Gummesson, 2000; Yin, 2018). Case studies are considered to help sharpen theories, show gaps and fill them (Siggelkow, 2007). Case studies help deepen understanding of the cultural context and highlight the importance of the research environment. In policy studies, case studies contribute to understanding interrelated individual and group phenomena (Yin, 2018). Case studies methodologically already provide ample evidence for researchers and policymakers. However, a more participatory approach is needed to increase accuracy and insight into innovation policy (Nordling & Pugh, 2019).

In the Study Case methods, some of the most common techniques applied include interviews, document analysis (secondary), and observation (Busetto et al., 2020; DeLyser & Sui, 2014; Garnett & Dorey, 2016; Rashid et al., 2019; Robson, 2002; Thelwall & Nevill, 2021). Firstly, *the Interview* is the most commonly used option in innovation policy studies. DeLyser & Sui (2014) argue that interviews have a broad potential to occupy more qualitative research positions because of their ability to express more than just words. Interviews take various forms, such as structured, semi-structured, open, and narrative interviews. Interviews allow us to find the core problem in a case, propose various follow-up investigations and facilitate respondents in telling their experiences (Simons, 2009).

In the case of innovation policy studies, semi-structured interviews are often used to discuss specific topics flexibly so that the discussion has become interesting but simultaneously focuses on the list of questions. There is also a so-called topical interview which can lead researchers to explore and obtain much information while keeping the conversation on track (Rubin & Rubin, 2011). Interviews need to be designed to be open and adaptive but need to be structured to answer research questions. There is a particular

phenomenon in the policy studies interview concerning the distance between the researcher (interviewer) and interviewee, the position or structure of power, and even the dynamics of gender. It takes careful preparation so that the data quality obtained is maintained. A mixture of simple descriptive and probing questions can be applied in dealing with tension combined with open and closed questions. Some respondents may be trained in answering and avoiding difficult questions (Fontana & Frey, 2000; Harvey, 2011; Yin, 2018). Hence, one of the researcher's strategies is to ask the same questions differently, ask the same questions to different people, or combine formal and informal language styles (Rubin & Rubin, 2011).

Secondly, *Document analysis.* Policy documents are the focal point of innovation policy research. This document will be analyzed qualitatively in qualitative research. Public policy has received less attention in methodology textbooks because it is a more specific sub-category than its main field. In analyzing political science texts that cover many public policy analysis methods, Garnett & Dorey (2016) summarize secondary document sources that can be used in studying public policy, including academic texts, articles, and newspaper reports. In addition, there are several examples of primary documents, such as documents made by government authorities, political parties, and journalists.

The innovation policy has a broad definition that makes finding related documents tricky. Using "keywords" when searching for documents or limiting the search to the scope of "topics" and specific terms can be applied in document searches. Thus, other documents unrelated to this particular keyword or topic will not be analyzed. Once the documents are found, the next step is determining how to analyze and interpret them. The following filtering can be done by quantifying the repetition of the same keyword. Besides, it can also take an inductive approach so that researchers have direction about what is contained in the document. The next step is to consider using a tool for analyzing documents such as ATLAS or NVIVO. This tool helps researchers process data related to policy documents, although many other researchers use a manual approach to coding and analyzing these documents.

Thirdly, *Observation.* As part of the research, observation involves observing daily behavior and interactions to gather various information (Jorgensen, 2015). Observations are generally divided into two groups. In the first session, participant observation, the researcher acts as a participant and an observer. In participant observation, the observed environment is aware of researchers participating in policy observation activities. In the second session, the researcher was not involved in the process and only observed or recorded the practical information, which could even be done away from the observation environment. Participant observation is not widely used in innovation policy studies, although it is well established in ethnographic studies (Nordling & Pugh, 2019; Robson, 2002). Participant observation is a fast way to gather information because researchers directly observe and listen. The only drawback is the observer or researcher's ability to be involved in the observed situation. It differs from interviews, where the researcher can easily communicate or obtain written evidence.

Observation can be used as the primary method or multi-methods (Robson, 2002). Observation can also be used in the interview or survey process to obtain additional information, record observations, observe non-verbal gestures, and obtain other information that cannot be recorded or not recorded in the interview transcript. Observation is also helpful for gathering additional information such as the number and types of participants present, the observation location, and the actions and reactions to interruptions. This additional information can also influence the information stated by the respondent.

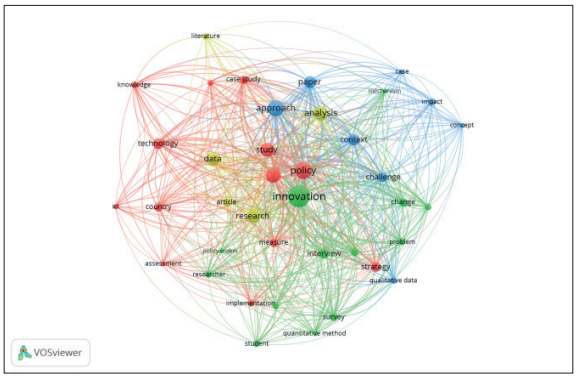
III. METHODOLOGY

Referring to the literature review method by Wibisono (2021), I started this research by conducting a simple bibliometric analysis using the main database, Web of Science, then performing a research network analysis using the VOS Viewer software. I apply the keywords "innovation; polic*; qualitative; quantitative; mix*; method*" to collect article data and exclude other kinds of

documents. The use of asterisks in the data search process is intended so that different words written differently with the same or similar meaning will appear in the search output, for example, *polic(y) and polic(ies)*, *mix and mix(ed)*, and *method and method(s)*.

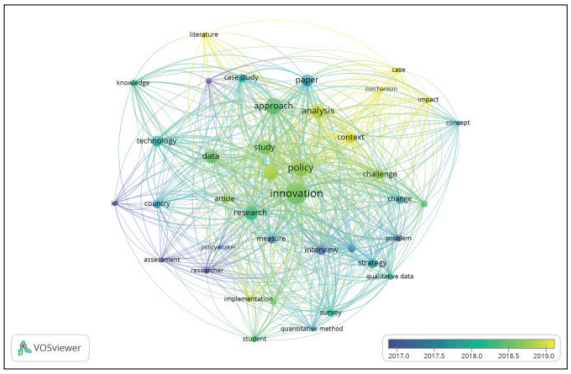
In the initial process, I obtained 83 articles related to all keywords. I conducted a network analysis to find new opportunities in innovation policy studies related to qualitative methodological approaches. Applying a mapping method based on text data analysis in the title and abstract and each article has at least four repetitions of the same word shows the mapping results in the following network visualization, overlay visualization, and density visualization.

As shown in Fig.1, network visualization shows that innovation policy studies and qualitative methods are still related (located in one network). However, the two main terms I use, qualitative methods, are pretty far from the main terminology, innovation policy studies. In this network, I also found two important terminologies in qualitative studies, including *case study* and *interview*, which are related to innovation policy studies but located far from the main terminology (innovation policy studies). In the Overlay visualization, Fig.2, I found that the research using the combination keywords I used in my study was relatively new; most research was conducted between 2017 and 2019. The density visualization Fig.3 shows that the discussion of qualitative methods concerning innovation policy studies is still relatively rare. It can be seen from the density of the dark color (blue-green). Based on the results of the bibliometric analysis, I argue that discussing qualitative methodologies in the context of innovation policy studies has the opportunity to enrich and add novelty to this field.



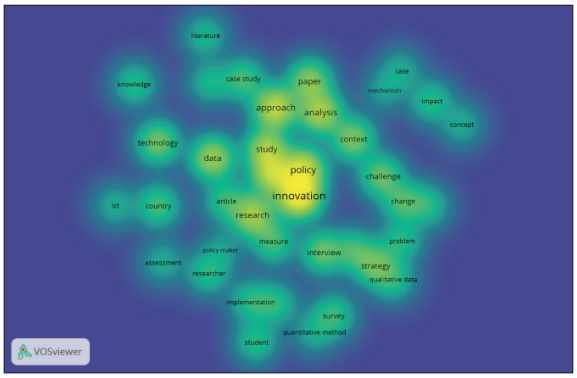
Source: VOSViewer output, own work

Figure 1. Network Visualization



Source: VOSViewer output, own work

Figure 2. Overlay Visualization



Source: VOSViewer output, own work

Figure 3. Density Visualization

Furthermore, I analyzed the initial collection of articles by reading the entire abstract to find the most relevant articles that would be the primary articles to be discussed in this paper. I found the 25 most relevant articles dealing with innovation policy studies and their relationship to qualitative methods. I am interested in discussing this topic further, considering that there are limited studies

related to this topic that I found in the bibliometric analysis. Firstly, this study will look further into the position of qualitative methods in innovation policy studies (which I describe in the Theoretical Framework section). In the Discussion section, I then discuss the expansion of qualitative research methods with two additional approaches: action research and participatory research, as well as the challenges of dealing with the observational environment and the challenges of collecting data. The Discussion section also aims to direct the reader to recommendations and future research opportunities.

IV. DISCUSSION

Expansion of the Qualitative Research Methods in Innovation Policy Studies

Several research approaches that will be discussed in this section are intended to enrich the existing qualitative research approaches that have been discussed in the theoretical framework section. In this part, I propose two additional qualitative methods for innovation policy studies that I summarize from studies conducted by Jensen & Glasmeier (2010), Jungmann et al. (2015), and Nordling & Pugh (2019), including *ethnography and action research*. In this section, it is not only the two extensions of the approach that will be discussed but also the challenges that may be encountered in the research environment and the challenges of building quality data.

According to Nordling & Pugh (2019), the research approach below has been widely applied to social studies and education but, unfortunately, has not been found in innovation policy studies. The participatory approach allows researchers to get closer to the topic of their research and can find more information behind documents or interview results. Meanwhile, an action-based approach can have a more significant impact, be more involved in the field, and possibly address the differences between practice and theory. Therefore, expanding the application of qualitative methods in these two ways, both separated or in combination with qualitative methods commonly used in innovation policy studies (interviews, document analysis, and observation) has the potential to increase research results and impact driven by improving the quality of varied and comprehensive data.

First, *Ethnographic research.* Ethnographic research has been well established in social sciences. It has even been used to study the innovation process of industrial networks, such as that carried out by Hoholm & Araujo (2011). However, this method is not yet widespread in innovation policy research, although it is very promising. The ethnographic approach can be combined with participant observation and interviews in a case study approach (Jungmann et al., 2015). Ethnography extends the observation method and involves researchers in long and in-depth field research. At its core, ethnography is a more participatory method of observation (Knoblauch, 2005; Seim, 2021). Ethnography can also be readily applied if the researcher has better access to the environment to be studied. Data collection in ethnographic research is carried out in several ways, including taking pictures, recording events, writing research diaries, and recording audiovisuals. In ethnographic research, researchers must also consider the acceptance of the environment or research participants and access required (Crang, 2003) and their beliefs about whether the researcher can represent a particular group well by observing without hearing directly from the object under study.

In innovation policy studies, researchers need to consider transparency and access to information obtained from the business or industrial environment, government, or non-governmental organizations because there is the possibility of special treatment of critical opinions from researchers (Crang, 2002, 2003). It can put the researcher in a difficult situation if it refers to, for example, the government as an observant whose trust and cooperation are indispensable for future research. In a strict and rigid environment, researchers must try to maintain and ensure their reputation. It will allow them to easily carry future research into the same group. Undesirable things that may put the researcher in a difficult position or may even interfere with the researcher's career can be avoided as early as possible, i.e., by conducting careful and open discussions with the authorities regarding the details of the research plan or conducting many technical consultations

with another colleague who are experts in the field to be researched.

Second, *Action research.* Action research positions the researcher in influencing the phenomenon under study, involving more subjects in the research, and making a significant impact. Action research is characterized by the researcher's "location" in the social environment and neglects objectivity (Jensen & Glasmeier, 2010). Action research is strongly influenced by participation, democracy, and interpretation. On the other hand, social, spiritual, political, and emotional dimensions are also considered. The outcome of action research is not a written report but a "change of situation" (Ladkin, 2004). Nordling & Pugh (2019) research related to innovation policy shows direct knowledge of the innovation policy process and the dynamics behind its design process, including its implementation and evaluation. Action research also allows researchers who use the case study method approach to analyze the evolutionary process of their research to gain another perspective on the relationships between the phenomena being studied (Rashid et al., 2019; Snyder, 2019).

Action research can control the direction of research and pay attention to its development, which is called evolution. It can also affect the type of data and how it is collected. The tools used for action research to obtain data are similar to ethnographic research, including notes, diaries, and personal reflections. Action research also helps collect more varied data than other traditional methods (Clark et al., 2020). They describe the innovation policy formulation process in detail and the tensions that occur in it that cannot be obtained through interviews. In addition, researchers may have difficulty in the field balancing actions such as scheduling meetings and committing to time, writing reports, or coordinating with other members.

The close personal relationship between the researcher and the research environment can be a dilemma for action-based research because most people will be more open and tend to be less careful about what they say when the researcher is a colleague. However, this demands the responsibility of researchers to be more cautious in describing their words and avoid getting into trouble when they say something confidential. Under these conditions, the ethical lines seem to become more blurred. Nevertheless, action researchers must remain cautious and committed to being on the right track (Clark et al., 2020; Fouka & Mantzorou, 2011; Kaiser, 2009; Knoblauch, 2005; Seim, 2021).

Ethnographic and action research are potentially comprehensive research strategies because researchers apply different techniques and can obtain additional data from the three qualitative techniques in the case study method. In addition, these two new approaches can also be combined with a case study approach to deepen the study and complete insights. On the other hand, this approach is not without its drawbacks. The information obtained highly depends on textual data, both transcription, and verbal data from interviews, literature publications, and researchers' observation notes. However, in the end, it will give the researcher an advantage because it has a lot of data. Pink (2007) states that images can be considered to have the same meaning as written text in ethnographic works. Crang (2003) mentions that visual documents, such as pictures and films, are often used in the study of geography. In the study of innovation, it is more advantageous if the researcher has many preferences about the dimensions of innovation in a sociological or geographical context. Visual evidence allows for a complex experience and perspective rather than just textual data. Visual evidence also helps remember observation conditions in the field to complement the data better and can even be analyzed together with text data.

In addition to image data, video data should be considered a supporting resource. (Holliday, 2000) used this technique to present research participants and complementary autobiographical data. In the case of innovation policy research, video recordings with permission may be used during program meetings, participant interviews, and other events. Video can also complement interview techniques which usually only use note-taking and voice recording. Videos can also complement observational techniques and help researchers capture more observational events.

Some drawbacks may arise in this video recording technique, for example investing in managing the video, cutting or editing the video, capturing certain parts of the video, etc. However, these costs should be overcome by planning a budget from the early stages of designing the research so that cost-related issues are addressed. The emergence of smartphones and the latest applications in the digital economy can be utilized in managing photo, image, audio, and video evidence obtained in the data collection process. Many technological advances have allowed the combination of several data collection techniques to be applied in innovation research (Antons et al., 2020; García-Álvarez, 2015). However, remember that the researcher must explicitly acknowledge and communicate with the participants and the observation environment about this visual recording plan (Sutton & Austin, 2015). It could be that the presence of a cellphone or camera can reduce comfort and even change people's behavior in the environment. For example, in a meeting of policy practitioners, taking pictures or videos is not easy and may even require special permission.

In addition, the presence of the internet on every smartphone and mainstream access via computers are opportunities to explore research methods, although methodologically, nothing is entirely new (Antons et al., 2020; BOUCHER, 2020; García-Álvarez, 2015). Text data obtained online and other text data, such as discourse analysis, can be analyzed. The internet is only a medium for securing text data, but it helps increase the senses' reach and overcome the complexity of space and time in the research process (Markham, 2004). Nordling & Pugh (2019) describe two experiences using the internet and technology platforms in studying innovation policy. They use surfing techniques to collect disparate data and analyze relationships between organizations in the digital space. This analysis is like analyzing traditional social networks in general; only that is done in the digital space. According to him, this provides an advantage where researchers can pay attention to developing these connections over time.

Furthermore, Nordling & Pugh (2019) also uses web channels to bring together policymakers and policy implementers and establish communication between groups through this channel. Researchers can observe the views of policy implementers about the innovation policies currently implemented and their opinions about these policymakers. This channel has effectively activated communication between policymakers (city officials, for example) and policy implementers (general public or specific organizations). Thus, the use of this channel can be followed by other innovation policymakers.

V. CONCLUSION

The application of qualitative methods in innovation policy studies has so far been dominated by a case study approach that uses mainstream research methods in the form of interviews, document analysis, and observation. The results of studies using this method generally produce case study summaries with limited information on the data and method details. Of the many advantages of using qualitative methods in various social science research, it was found that innovation policy studies still provide ample scope for the use of qualitative methods to enrich the field of study and increase the impact of research.

The main purpose of this literature review paper is to point out two critical methods that are extensions of qualitative methods in innovation policy studies. Case studies commonly applied in innovation policy research generally use three main methods: interviews, document analysis, and observation. However, some social science studies and innovation policy experts propose Ethnographic research and Action research as extensions of the three methods. These two extension methods show advantages in increasing the results of comprehensive analysis and research impact.

Ethnographic research is an essential methodological tool in social science studies. However, although very promising, this method has not been widely used in innovation policy research. This method is suitable when combined with the interview and observation methods as in the case study. Ethnography is more participatory, ideal for research that provides a long enough time to allow for more in-depth searches. It can be applied easily if the researcher has qualified

access to the research environment. There are several common ways of collecting data using ethnographic methods, including taking photos or pictures, recording events (audio/video), and writing daily journals. An important factor in ethnographic research that will determine the current position of researchers in the future is the acceptance of the environment that will become the object of research and the critical opinions of researchers that can be accessed by external parties (stakeholders) such as government, private or industry, and NGOs. Therefore, open discussion and consultation with experienced experts must be carried out carefully to prevent adverse effects on the researcher's career.

Action research involves the researcher on a more real phenomenon on the research subject so that it has the potential to have a more significant research impact. Action research is strongly influenced by participation, democracy, and interpretation, in addition to considerations of the research environment's social, political, spiritual, and emotional dimensions. Because of the complexity of action research, the most important outcome is a change in the situation. Because it can be applied to a relatively long research period, action research also allows researchers to see their research's evolution and look at the research phenomenon being studied. The tools used for action research are similar to ethnographic research, including notes, diaries, and personal reflection. Action research can also describe the innovation policy formulation process in detail and the tensions that occur in the process that cannot be obtained through interview techniques. On the other hand, because it involves many parties, action research demands commitment and credibility from the researcher and the research environment.

Several challenges that can be noted in this study relate to the dependence of research on data sources derived from textual data both from secondary data and from primary data obtained during interviews and observations. The advantages of ethnographic and action research are using image, audio, and visual media simultaneously, which can provide more complex information than text data. In addition, budget issues are also likely to arise in the process of ethnographic research and action research. However, a careful research proposal process with a systematic and thorough budget design increases the success of the research and prevents weak data quality due to budget problems. Ethnographic and action research seems to require a significant investment allocation, but it will pay off with the acquisition of complex and comprehensive data. In addition, the use of smartphones and increasingly sophisticated applications allow for more convenience in acquiring and storing field data. The thing that must be considered is that researchers must be able to build communication and capture the beliefs of research subjects regarding privacy and comfort.

This literature study has obvious limitations. Research articles discussing qualitative methods and their application in innovation policy research were perhaps the main obstacle I faced in the initial data (paper) search process. Although I ended up using 25 main articles in constructing the literature study, my primary aim to explore ethnographic research and action research as an extension of the well-established case study method in innovation policy studies was limited by the number of papers available. Since this paper aims to present a literature review of the two approaches, I acknowledge the weakness of this paper is providing a concrete example of how these two extensions of qualitative methods should be applied. Therefore, I notice that there are further research opportunities in discussing separate studies of ethnographic and action research complemented by empirical exercises if possible. Another possible option is to present a systematic review of literature from ethnographic research and action research concerning innovation policy.

ACKNOWLEDGEMENT

Funded by the European Union

The author gratefully acknowledges the support provided by POLISS (https://poliss.eu), the funded project under European Union's H2020 Research and Innovation Programme, Grant

Agreement No. 860887. Views and opinions are only those of the author(s) and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them. The author also thanks the two anonymous reviewers for their constructive criticism and suggestions.

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