Pragmatic methodology in management science

HENRYK DŹWIGOŁ, MATEUSZ TRZECIAK

Abstract

The article intends to demonstrate the importance of choosing suitable research methods and techniques in the field of management science, with the goal of enhancing the dependability, depth, and excellence of the conducted research. A two-stage international survey conducted using survey questionnaires based on a target group of academics conducting research in management science and managers conducting research in core management activities was used to achieve the stated goal. The research findings unequivocally emphasise the significance of practical methodology in the pursuit of identifying methods and approaches that impact the trajectory of the research process and the efficacy of organisational operations. The research results obtained provide a broader perspective on pragmatic methodology, especially the perspective of methods for scientific activity subordinated to the pragmatic solution of research problems. The empirical implications of this article focus mainly on answering the research questions posed, thus providing recommendations for both academics conducting research in management science and managers conducting research in core management activities.

Key words

pragmatic methodology, research methods, management science, research process.

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Introduction

The dynamic development of systematic methods for managing knowledge resources brought about by the opportunities provided by information and communication technologies (Chu & Evans, 2021; Kwiek, 2021) is leading to greater interest among researchers in the methodology of management science (Shaturaev, 2022). Scientific publications covering this issue attempt to incorporate the conventions of methodology creation through the evolution of methods (Ferran-Ferrer et al., 2017; Almalki, 2016; Tonidandel et al., 2016), the identification of common ground

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that determines their identity (Hair, 2019; Dźwigoł, 2019) or the analysis of methodological aspects (Van Calster et al., 2021). As Kaushik & Walsh (2019) point out, there is still a lack of a comprehensive view of the achievements of researchers in the field of pragmatic methodology, especially from the perspective of methods for scientific activity subordinated to the pragmatic solution of research problems. In addition, the literature on the issue stresses the requirement for uniqueness in scientific endeavour, which is also made feasible through problematisation (Quinlan et al., 2019). According to Alvesson and Sandberg (2013) or Dźwigoł et al. (2023), there are alarmingly few innovative concepts and few management science research findings that have a significant impact on practice.

This is because traditional ways of expanding knowledge, such as seeking to close the "knowledge gap", building a hypothesis on top of another or gathering and analysing empirical evidence are no longer as effective as once thought. Moreover, Alvesson & Kärreman (2007) emphasise that data do not necessarily generate an interesting, original research problem, and do not by themselves create reflection. According to the authors, it is useless to try to reduce the subjectivity of the researcher and the subjectivity of the theoretical assumptions they choose because, by doing so, one loses the element that strengthens the environment's capacity to learn about and comprehend interesting problems in greater depth (Alvesson & Kärreman, 2007). Therefore, during the research process, the focus ought to be on deconstructing the assumptions and foundations that underlie a specific theory, rather than solely on data processing, according to Hiver et al. (2021). Returning to the fundamentals and exploring the deeper levels of knowledge in management science will only aid in eschewing trends. After all, the outcomes of a scientific endeavour that is popular at a specific moment are challenging to incorporate into outdated paradigms, institutions, beliefs, or sectors (Ahmadin, 2022). Fads, according to Benders & van Veen (2001), can simply create the appearance of novelty and put more pressure on those who provide scientific ideas while producing products of lower calibre. With regard to this, three steps can be identified to reactivate the original curiosity that once inspired researchers, i.e.:

- Identifying the currently recognised basis for a particular type of research (Snyder, 2019);
- Creating conjectures about the causes of conformity and differences, as well as the sources of success in the application thereof (George, 2019);
- Building hope that the breadth of overlapping individual obviousness revealed in later writings can be replicated (Ahmadin, 2022).

The analysis of literature on conducting research in management sciences shows the need to identify the most suitable methods, procedures, and approaches for the research process and the various elements thereof. This identification allows for the recognition of patterns in the perception of the research process and other variables that may impact the selection of appropriate methods and techniques, leading to higher quality research. Moreover, in the methodological layer, the search for models of ideal concepts of method selection enriches the pragmatic methodology of the management sciences (Dźwigoł & Dźwigoł-Barosz, 2018; Tkachenko, 2019) with a new, unprecedented use of methodological approaches in the literature, as it inspires the creation of methods directly applicable to the practice of management (Kanakaris et al., 2019; Snyder, 2019; Hiver et al., 2021).

1. Theoretical background

This chapter focuses on presenting the importance of pragmatic methodology in the search for methods and approaches that affect the research process and the effectiveness of the operations of an organisation.

1.1. Management methodology

Management methodology seeks rules that primarily lead to the acquisition of reliable knowledge, as well as changes that contribute to increasing the efficiency of organisational activities (Thomas & Raheem, 2020; Dźwigoł, 2019). Pragmatic methods are the most ancient group of research methods employed in management science, as noted by Maarouf (2019). These methods have a common-sense quality, according to Dźwigoł (2022). Their characteristic feature is the solution of practical problems faced by human individuals, rather than a focus on reaching the truth (Taguchi, 2018). At their core, their primary value criterion is effectiveness in the area of change, which can mean an increase in organisational efficiency (Kelly & Cordeiro, 2020). Pragmatic methods strive towards implementation techniques, both from the field of law (Donald, Speck, 2019) and engineering (Viroli et al., 2019) against a common-sense background (Dźwigoł, Dźwigoł-Barosz, 2018).

When considering technical and economic sources, the neopositivist movement clearly distinguishes between research approaches and practical ones (Boonmavichit & Boossabong, 2022). Efforts to attain an optimal state of knowledge in the field of organisation and management necessitate the utilisation of an ideal approach, both within the pragmatic and cognitive domains, which results in improved organisational efficiency. In the critical stream, research must be committed to pursuing emancipatory change (Alvesson & Willmott, 1992). On the other hand, Weick (1995) contends that, in contrast, the interpretive-symbolic paradigm and postmodernism eliminate the distance between the researcher and the organisational reality being investigated. As a result, it is impossible to differentiate between cognitive and pragmatic methods.

As the authors point out (Dźwigoł & Dźwigoł-Barosz, 2018), the range of management methods includes not only specific methods, but also those borrowed from other sciences, for example, the survey method (taken from sociology) (Mohajan 2018), casuistic methods (taken from legal sciences) (Gábriš, 2019), or the observation method (taken from natural sciences) (Qutoshi, 2018).

Sułkowski (2013) asserts that the prevailing perspective is the neopositivist-functionalist-systems approach, which combines practical techniques that enhance efficiency with cognitive methods that aim to provide reliable and objective knowledge about management and organisation (Hassmén et al., 2016). This approach employs various management tools, such as human resource, financial, and information management, and assesses management efficiency and effectiveness using measurement methods (Armstrong, 1993).

As Flick (2002) notes, the approaches of the neopositivist paradigm are criticised for, among other things, lacking flexibility, being overly purist, and failing to reflect psychosocial dynamics.

Dźwigoł & Dźwigoł-Barosz (2018) identify an alternative paradigm, which is rooted in the humanistic traditions of social sciences. This paradigm encompasses various methods such as:

- Psychological techniques for management that employ qualitative and quantitative research. This includes creative techniques, team formation, attitude and motivation studies, and leadership development;
- Organisational anthropology, which uses field methods to study organisations (Cabot, 2019);

- Ethnomethodology, developed by H. Grafinkel (1967), which uses conversational methods to identify linguistic categories that structure social situations (Hammersley, 2019);
- Sociology of intervention, which emphasises the role of the researcher in forming groups and developing situational solutions (Touraine, 2020);
- Grounded theory, which suggests pluralistic research strategies that combine qualitative and quantitative techniques;
- Case studies, participatory action research, discourse analysis, and metaphorical methods.

The abovementioned methods emphasise qualitative and field research and are applied by both academic researchers and consulting firms. The alternative paradigm employs various research techniques such as participant observation, in-depth and group interviews, social intervention methods, discourse analysis, and critical incident techniques (Halkier, 2010).

1.2. Science and practice in the research process

The methodology of management science faces challenges in the modern scientific and commercial landscape, which highlights the key issues encountered by the methodology of this discipline and limits its potential. Here we can mention external conditions (Semko & Altukhova, 2020), breakthrough periods in its development, taking into account the processes of globalisation (Hussain et al., 2021), or more efficient methodological proposals (Bartnicki & Dyduch, 2019). Establishing guidelines for the use of pragmatic methods, as identified by Dźwigoł & Dźwigoł-Barosz (2018), Maarouf (2019), and Taguchi (2018), is essential in order to enable both researchers and practitioners to select research methods effectively. The dissemination of methodological paradigms, particularly in modern management science, is also crucial for the advancement of this field of study (Czakon, 2011). These factors would facilitate the selection of appropriate research methods and enhance the development of this branch of science. Modern management science puts the fundamental theories that explain the sources and perceptions of change in organisations at a higher theoretical level (Hussain, 2019). These considerations stem primarily from life cycle theory, theological theory, dialectical theory or evolutionary theory. These seemingly constitutive theories specify the processes of change as a certain cycle of formalised activities and events. In the pursuit of scientific knowledge in the field of management, it is crucial to consider the primary impulse of management practice, as emphasised by Dyer (1996) and McCullough & Cunningham (2010). This concept is closely connected to the internal and external factors that influence the evolution of individual enterprises in response to changes in the environment, as discussed by Agarwal (2018).

Various methodological currents, including engineering, universalist, human relations, operational research, social systems, empirical, systemic, organisational game, situational, and cybernetic approaches, have been analysed, leading to new and radical changes in the field, as detailed by Lisiński (2013) and Mingers & White (2010). Furthermore, contemporary theories such as psychological and sociological theories of organisation by Small (2011) and Schwemmer & Wieczorek (2020), respectively, as well as praxeological, modernist, postmodern, and process models, provide a foundation for further scientific exploration, as highlighted by Dźwigoł & Dźwigoł-Barosz (2018). It is continually improved with fresh material as a result of scientific advancements and the demands of contemporary reality (economic practice) (Závadský et al., 2021).

At the same time, it should be noted that the methodology of the alternative paradigm has certain shortcomings (Panhwar,

2017). Namely, the lack of heterogeneity of methods results in the difficulty of comparing results, and it is not effective and efficient when studying mass processes. Since it is based on assumptions of intersubjectivity, there is difficulty in indicating the objectivity of the results and their reliability. The use of the researcher's personal perspective in the alternative paradigm can lead to ethical concerns, as pointed out by Guba & Lincoln (1994).

There is a strong link between science and practice, as scientific studies are often triggered by real-world problems or phenomena. Science can be divided into theoretical and practical sciences, with the latter aiming to address real-world problems or occurrences. The practical application of research findings is essential, as theoretical sciences seek to understand the natural and social world without considering how people will use the research in their activities (Vesel, 2011). There must be a theoretical layer in addition to the practical layer and vice versa.

By offering models of practical organisational and management solutions as well as strategies for putting them into practice, management science serves the pragmatism of economic and social life (Dźwigoł & Dźwigoł, 2020). Management sciences are closely related to economic activity, and research in this field must be based on both theory and practice. Although management sciences are often considered practical or applied sciences (Trzeciak et al., 2022; Kaushik & Walsh, 2019), they also conduct theoretical research that is essential for advancing the field. Without theoretical research, science cannot progress (Mintzberg, 2017). It is crucial to bear in mind that management sciences emerged in response to economic needs and have evolved in response to changes in the economy. The growth of the economy has led to and continues to lead to the establishment of a reality and environment for company operations that are becoming increasingly complex. Therefore, the origin of management science can be viewed as generally practical. The conditions of economic and social activity are becoming more complicated and variable as economic and social life becomes more complex. As a result, practice calls for increasing amounts of science. Thus, it can be said that management science is frequently the key to the growth and attainment of an enterprise's competitiveness in the modern economy (Vaníčková & Szczepańska-Woszczyna, 2020). The temporary nature of the claims made is, regrettably, the fundamental drawback of management science. The following facts account for this impermanence (Dźwigoł & Dźwigoł, 2020):

- The subjects of study in management science are not static, but they change over time due to various external and internal factors. Therefore, the research must consider the variables that affect the evolution of the subject and be conducted in a way that accounts for these variables.
- Companies are complex entities that have multiple components, including human resources, financial resources, technology, and products/services, which makes it difficult to study them. Therefore, researchers must consider the complexity of the research object and use appropriate research methods to obtain a comprehensive understanding thereof.
- Some aspects of management science, such as human behaviour, motivation, and culture, are difficult to measure or quantify. Therefore, researchers must use appropriate research methods that capture these qualitative elements and analyse them effectively.
- The context of the historical era can influence the way management theories and practices are evaluated. Therefore, it is essential to consider the historical context when analysing the validity of management theories.

- There can be issues with the accuracy and generalisability of research findings in management science. Therefore, researchers must use appropriate research methods that minimise bias and error and ensure that the findings are valid and reliable.
- Many management theories and practices are based on normative judgments rather than objective facts. Therefore, it is essential to recognise the normative nature of these assertions and evaluate them accordingly.
- The importance of applying the findings of management research in practice to validate their effectiveness. It suggests that management theories and practices must be tested in the real world to evaluate their impact and effectiveness.

Despite the transience described above, collaboration between science and practice should be strategically considered while running a 21st-century business.

2. Methodology

In this chapter, the authors explain the quantitative research method they used, which involved a deductive approach and a questionnaire. They applied the perspective of critical realism and drew on the conclusions of their literature review to determine the most suitable research methods for management science. To explore the topic in greater depth, the authors formulated six research questions, which aimed to investigate various aspects of research processes in management science. They used a two-stage quantitative study to answer these questions, which involved both theoreticians and practitioners in order to gain a more comprehensive understanding of the subject. This method permitted the researchers to obtain a wider and more comprehensive understanding of the issues being studied in the field of management science.

RQ1. Is it necessary to use case studies to support qualitative methods in research processes?

RQ2. Can combining the science and practice of management only occur after verifying the developed methods, models, or procedures?

RQ3. Does the case study provide an opportunity for an in-depth analysis of the research problem?

RQ4. Can group expert evaluation be the primary method for verifying the direction of research?

RQ5. Is it necessary in research processes for the management sciences, based on the observation of facts and the classification used in the general methodology of inductive sciences, it is essential to use two critical methods? The first method is conducting observations in natural conditions, where the researcher collaborates with the subjects being studied. The second method is observation-intervention, which takes place as part of management activities in the studied entities, where the researcher has a direct impact on the decisions made.

RQ6. Is it possible to enhance the quality of science and practice in management through the development of research-based recommendations?

2.1. Description of the quantitative research method

A two-stage international study was conducted using anonymous survey questionnaires based on a target group of theoreticians (scientists conducting research in management science) and practitioners (managers conducting research as part of their core

management activities). The structure of the survey questionnaires was based on the literature review of research methodology, and discussions with other academics, as suggested by Saunders et al. (2009).

The initial survey was designed to gather information from managers who conduct research as part of their core management activities. It was divided into four parts, with the first part containing general inquiries about research and available methods (six inquiries), the second devoted to the applicability of methods and techniques in management research (two inquiries), the third consisting of questions about improving research processes (four inquiries), and the fourth containing a metric (five questions). The questionnaire included closed (eight questions), open-ended (five questions), and matrix-form (four questions) questions using a five-point Likert scale to ensure ease of completion.

The second survey was aimed at academics conducting research in management science, and consisted of three parts. The first part contained questions about the relevance of approaches, processes, methods, and techniques in management research (five questions), the second addressed the enhancement of the research process (33 questions), and the third included specific questions (three questions). The majority of the questions were closed-ended and used a matrix format with a five-point Likert scale for ease of completion. Surveys were distributed in hard copy at relevant conferences and electronically to a pre-prepared email database.

The research is presumed to be trustworthy given that it is exploratory in nature. The degree of error, which is tied to the measurement tool employed and emerges randomly in successive measurements made using a particular tool, determines reliability (Cresswell, 2009). Reliability was assessed using Cronbach's alpha coefficient. Each element presented using the widely-used Likert scale, which was adopted for further analysis in this article, is highly reliable, as shown in Table 1.

Table 1. Measuring reliability within the given research questions in the survey questionnaires for scientists and practitioners

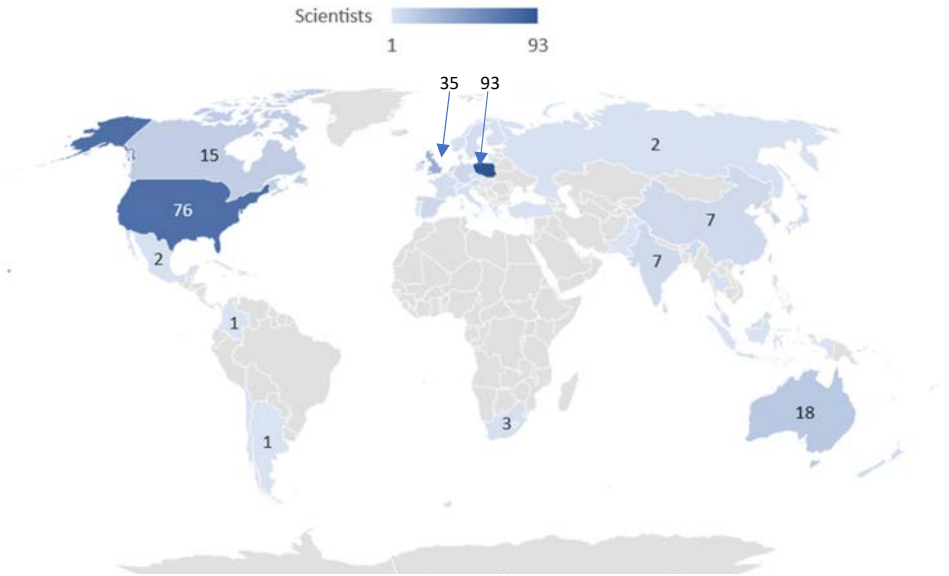
Specification	Cronbach's alpha coefficient value	
	Scientists	Practitioners
RQ1	0.876	–
RQ2	0.874	0.964
RQ3	0.878	–
RQ4	0.878	–
RQ5a	0.879	–
RQ5b	0.878	–
RQ6	0.877	0.971

Source: own research

2.2. Description of the quantitative research method

Theoretical selection is the sample technique used in surveys; therefore, the experts should be individuals who are most knowledgeable about the study's themes (Bell et al., 2018). A quantitative research study was conducted using a survey questionnaire, targeting a sample group of 365 universities with management science departments or units, 23,331 academics affiliated with management sciences, and 235 enterprises. To ensure representativeness, presumptions were made to calculate the necessary sample size for a group of academics. These presumptions included assuming a p-fraction rate of 50%, an error magnitude of 5%, and a significance level of $\alpha = 0.05$. The minimum sample size was determined to be 385 completed questionnaires. The study surveyed 196 practitioners from 12 countries and 401 management science theorists from 45 nations. The geographical distribution of the respondents is presented in Figure 1 and Table 2.

Figure 1. Geographical distribution of respondents (group of scientists) by country



Source: own research

Table 2. Summary of the distribution of respondents (group of scientists) by country

Country	Number of experts	Percentage	Country	Number of experts	Percentage	Country	Number of experts	Percentage
Poland	93	23.19%	Indonesia	1	0.25%	Russia	2	0.50%
Argentina	1	0.25%	Ireland	2	0.50%	South Africa	3	0.75%
Australia	18	4.49%	Israel	1	0.25%	Singapore	2	0.50%
Austria	5	1.25%	Japan	5	1.25%	Switzerland	4	1.00%
Belgium	3	0.75%	Canada	15	3.74%	Sweden	5	1.25%
Chile	1	0.25%	Colombia	1	0.25%	Thailand	2	0.50%
China	7	1.75%	South Korea	11	2.74%	Taiwan	6	1.50%
Czech Republic	1	0.25%	Lithuania	2	0.50%	Turkey	1	0.25%
Denmark	5	1.25%	Portugal	2	0.50%	USA	76	18.95%
Finland	2	0.50%	Malaysia	5	1.25%	Hungary	1	0.25%
France	5	1.25%	Mexico	2	0.50%	UK	35	8.73%
Greece	1	0.25%	Germany	8	2.00%	Italy	3	0.75%
Spain	8	2.00%	Norway	2	0.50%	United Arab Emirates	1	0.25%
Netherlands	8	2.00%	New Zealand	6	1.50%	Other	26	6.48%
Hong Kong	5	1.25%	Pakistan	1	0.25%			
India	7	1.75%						

Source: own research

In the case of the group of business employees (practitioners), it was determined on the basis of the power factor of the test (Table 3), assuming:

- Hypothesis 0 (H0). $R = I$ (fractional coefficients are equal in both study groups)
- Hypothesis 1 (H1). $R \neq I$ (fractional coefficient in the theoreticians' group is greater than the coefficient of theoreticians in the practitioners' group)

Table 3. The postulated sample size among the group of practitioners

Sample size (factor loads: two fractions, Z test H0: Pi1 = Pi2)	Value
Fraction in the Pi1 population	0.6710
Fraction in the Pi2 population	0.3290
Probability of Type I (Alpha) error	0.0500
Target power	0.9000
Power (with correction for continuity)	0.9071
Sample size N1	401
Sample size N2	25

Source: own research

After interpreting the results, it was found that obtaining 196 responses from practitioners fulfils the condition for proving the assumption made earlier, that the fraction in the group of theoreticians is statistically significantly larger than the fraction in the group of practitioners. Details of the geographic distribution of the group of practitioners are shown in Table 4.

Table 4. Summary of the distribution of respondents (group of practitioners) by country

Country	Number of experts	Percentage	Country	Number of experts	Percentage
Belgium	3	1.53%	France	5	2.55%
Brazil	2	1.02%	Spain	3	1.53%
China	2	1.02%	Ireland	2	1.02%
Denmark	3	1.53%	Japan	3	1.53%
Germany	3	1.53%	USA	28	14.29%
Poland	139	70.92%	UK	3	1.53%

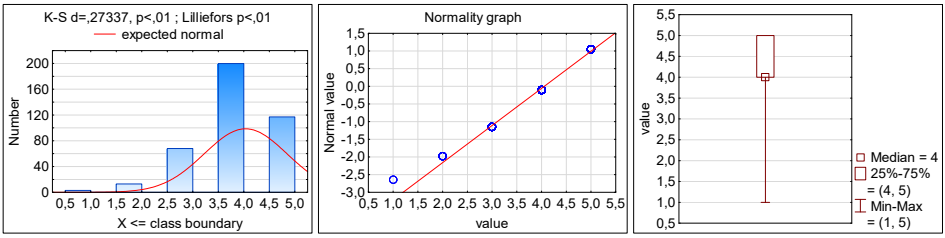
Source: own research

3. Research results

This section displays the findings of studies which were chosen to answer the research questions. The obtained results provide a more comprehensive understanding of the components of the research process, adding to the practical methodology of management science. The section is organised into six sub-sections based on the chosen methodological framework.

3.1. RQ1 – Is it necessary to use case studies to support qualitative methods in research processes?

Figure 2. Summary of the research findings on the use of case studies to support qualitative methods in research processes. These results are based on a survey of 401 management science theorists



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	117	200	68	13	3
%	29.18	49.88	16.96	3.24	0.75

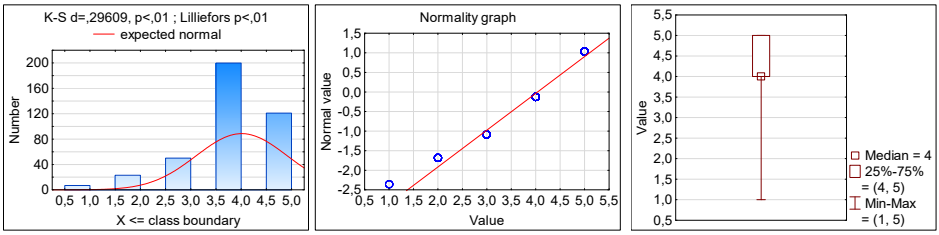
Source: own research

Based on the analysis of survey results, the majority of respondents (78.06%) agreed that case studies can support qualitative methods in research procedures. A study object can be an individual decision on the one hand (Mintzberg, 1979), a given business process of an organisation (Dyer & Nobeoka, 2010), a cluster (e.g., Silicon Valley) or an entire country on the other hand (Buck & Shahrim, 2005). For this reason, it must not be assumed that an object's designation as a case study is determined by its size or characteristics. Unlike quantitative research, where characteristics, sample size, and sampling methods are emphasised, the nature of a case study is determined by the use of multiple exploratory methods to gain a deeper understanding of the studied phenomenon. In some cases, the nature of the case is determined by the use of interpretive methods, as noted by some researchers (Dul & Hak, 2016). In management sciences, theory testing is conducted through quantitative methods that determine the regularity of a proposed relationship between variables using statistical techniques to confirm the hypothesis. However, case studies are often used to test theories using falsificationism, which means disproving a theory using case studies that contradict it or demonstrate that the theoretical explanation cannot help to understand the organisational reality.

3.2. RQ2 – Can combining the science and practice of management only occur after verifying the developed methods, models, or procedures?

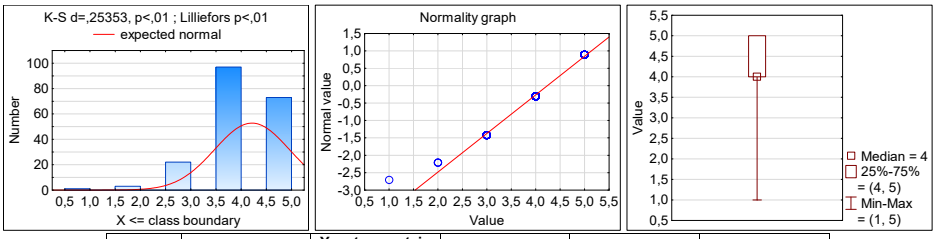
Figure 3. Can combining the science and practice of management only occur after verifying the developed methods, models, or procedures? – survey results: a) group of theoreticians (N=401), b) group of practitioners (N=196)

RQ2 – Results in the group of theoreticians (N=401)



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	121	200	50	23	7
%	30.17	49.88	12.47	5.74	1.75

RQ2 – Results in a group of practitioners (N=196)



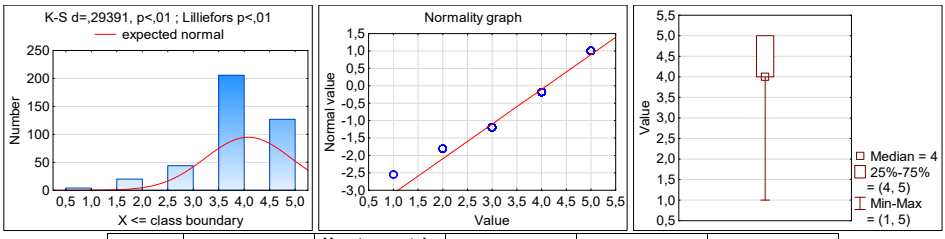
Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	73	97	22	3	1
%	37.24	49.49	11.22	1.53	0.51

Source: own research

This sentiment is echoed in the literature, as noted by Dźwigoł et al. (2019), who emphasise the importance of employing heterogeneous research methods to provide a comprehensive answer to the research problem. In addition, the increasing use of various modelling, organisational management, and cognition methods has created a need for an open methodology that can facilitate and encourage the integration of numerous methodologies (Thomas, 2017). Furthermore, it has been pointed out that testing these methodologies, models, or procedures in real-world settings is necessary to lend credibility to the research process and produce dependable data (O'Leary, 2017). In summary, verifying the established methodologies, models, or procedures is a prerequisite for merging management science and practice, and this is supported by both the analysed data and relevant literature on the topic.

3.3. RQ3 – Does the case study provide an opportunity for the in-depth analysis of the research problem?

Figure 4. Does the case study provide an opportunity for the in-depth analysis of the research problem? Survey results from the group of theoreticians (N=401)



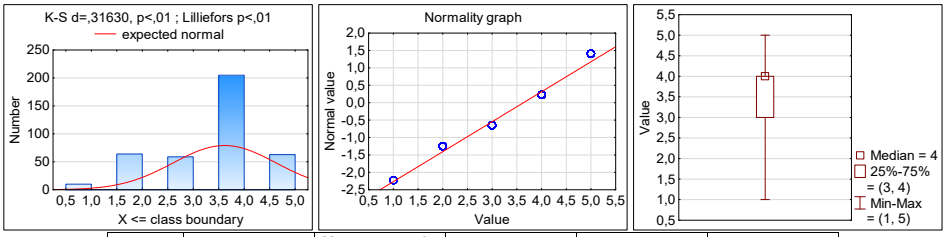
Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	127	206	44	20	4
%	31.67	51.37	10.97	4.99	1.00

Source: own research

After analysing the data, it has been found that a large majority of respondents (83.04%) believe that case studies provide an opportunity for a comprehensive examination of the research problem. A case study involves a detailed analysis of phenomena and processes in their actual context (Beach and Pedersen, 2016; Tight, 2017), which is beneficial in terms of providing a better understanding of the object of study, although it is not used to test theories, but rather to falsify existing hypotheses. The contextuality of case studies has various consequences, which may be procedural, cognitive, or tool-oriented. The procedural consequence is due to the inability of the researcher to predict the impact of circumstances at the time of entering the study, leading to the assumption of repetition. The cognitive consequence refers to the situational knowledge gained from case studies, which may not be repeated. Finally, the tool-oriented consequence is that case studies require the consideration not only of the object of study but also its environment and the impact of that environment on the object being studied.

3.4. RQ4 – Can group expert evaluation be the primary method for verifying the direction of research?

Figure 5. Should group expert evaluation be the primary method for verifying the direction of research? Survey results from the group of theoreticians (N=401)



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	63	205	59	64	10
%	15.71	51.12	14.71	15.96	2.49

Source: own research

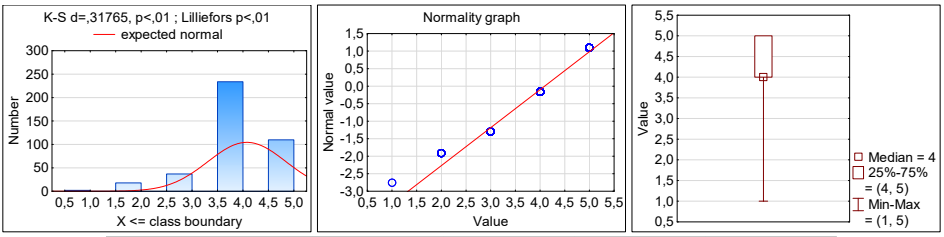
A significant proportion of scientists (66.83%) believe that the group expert evaluation method should be the basis for verifying the direction of research.

From the above, it can be inferred that utilising a case study allows for a comprehensive examination of the research problem, and expert evaluation is a vital technique for validating the direction of the research. Additionally, it simplifies the creation of the research methodology model and the selection of research methods and techniques. Furthermore, the method of group expert evaluation uses the achievements of the discipline, whose object of research is the processes of creative thinking, i.e. heuristics. It defines recommendations, through the use of which it is possible to solve problems more effectively. At this point, it should be noted that the role of heuristic methods in business management, with particular reference to decision making, is very large and well-established. In decision making, the method of group expert evaluation is most often used. Dźwigoł (2019) provides additional support to the previous statement, ranking the most significant management science research methods in order of prevalence, which includes observation, interviews, documentary analysis, surveys, and group expert evaluation.

3.5. RQ5 – Is it necessary in research processes for the management sciences, based on the observation of facts and the classification used in the general methodology of inductive sciences, it is essential to use two critical methods?

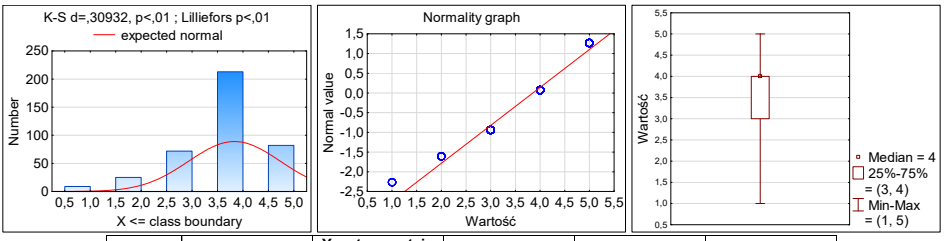
Figure 6. Summary of research results on: (a) observations of research conducted under natural conditions and (b) observation-interventions. Survey results from the group of theoreticians (N=401)

RQ5 (a) – observations conducted under natural conditions, and the researcher interacts with the subjects under study – research results of theoreticians



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	110	234	37	18	2
%	27.43	58.35	9.23	4.49	0.50

RQ5 (b) – observations-interventions that take place as part of management activities in the entities studied, and the researcher has a direct influence on the decisions made – research results of theoreticians



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	82	213	72	25	9
%	20.45	53.12	17.96	6.23	2.24

Source: own research

Upon analysing the obtained results, it is evident that a large percentage of the respondents (85.78%) consider the natural observation of ongoing research to be a crucial aspect thereof, which involves direct interaction between the researcher and the subjects under study. Additionally, observation-intervention (73.57%), which involves researcher influence on the decisions made as part of management activities in the subjects under study, was also considered important by the majority of respondents.

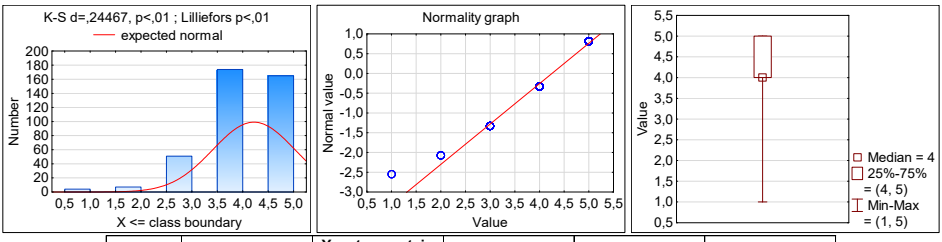
Mariani and Pego-Fernandes (2014) suggest that observation is an extremely adaptable and comprehensive approach to data collection. It is frequently referred to as a research approach for this reason, as well as because of its complexity. This inclination cannot be regarded as appropriate because observation, which brings together several auxiliary techniques, is a key component of cognitive processes. As a result, it is a flexible method of inquiry (Baker, 2000), but it also continues to be the most fundamental

when looked at independently in terms of both its history and substance. Observation is a research technique that uses perception to obtain data (Mariani, Pego-Fernandes, 2014). Observation can be a simple, intuitive way of noting down facts and events, or it can be a more systematic and sophisticated process that includes the use of tools such as questionnaires, as well as the opportunity to capture images and sound. Additionally, through observation, the researcher can learn a great deal of incredibly "natural" and accurate information about the group being studied (Coe et al., 2021).

3.6. RQ6 – Is it possible to enhance the quality of science and practice in management through the development of research-based recommendations?

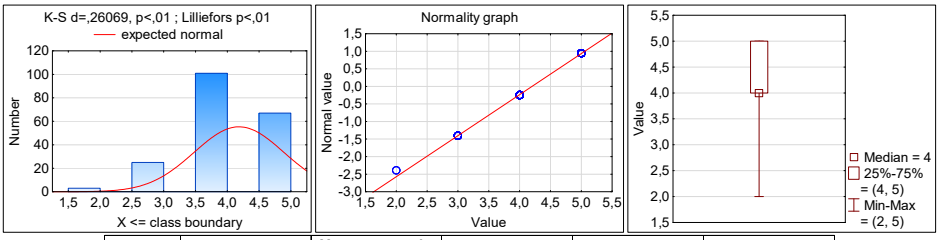
Figure 7. Is it possible to enhance the quality of science and practice in management through the development of research-based recommendations? Research results: a) Group of theoreticians (N=401), b) Group of practitioners (N=196)

RQ6 – Results in the group of theoreticians (N=401)



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	165	174	51	7	4
%	41.15	43.39	12.72	1.75	1.00

RQ6 – Results in a group of practitioners (N=196)



Class	Yes	Yes, to a certain extent	I don't know	Probably not	No
Number	67	101	25	3	0
%	34.18	51.53	12.76	1.53	0.00

Source: own research

The data analysis indicates that both theoreticians (84.54%) and practitioners (85.71%) place significant emphasis on the importance of developing recommendations to enhance the scientific and practical level of the solution, as concluded from the research results.

The conclusions resulting from the analysis (research) are used to expand existing knowledge on the subject or to polemicise with theory. To conclude, it is important to acknowledge the limitations of the research and suggest areas for further

investigation. In the field of management science, it is common practice to provide recommendations that align with economic realities. The research methodology outlined in management science is influenced by the phenomena observed in organisations.

4. Discussion

The research has made a significant contribution to the field of management science by identifying the most relevant and effective methods, procedures, and approaches for conducting research. Through careful analysis of the data obtained, researchers have been able to identify the most popular research methods, including observation, interview, documentary analysis, survey, and group expert evaluation, and their order of popularity. In addition, the study has highlighted the importance of verifying developed methodologies, models, or procedures before integrating science and practice. This can be achieved through the use of case studies, which provide an opportunity for an in-depth analysis of the research problem, and group expert evaluation, which is a fundamental method for verifying the direction of the research.

Moreover, the study has identified the importance of observation as a versatile and comprehensive technique for gathering information, which can involve both a straightforward, impulsive notation of facts and events and a more controlled process of systematic observation, including additional tools such as questionnaires and recording of images and sound. The research has also found that both observation of ongoing research under natural conditions and observation-interventions are crucial for obtaining relevant information, with researchers having a direct influence on decisions made.

The study has also identified certain regularities in the perception of the research process in the context of management science, as well as other variables that may impact the importance of selecting appropriate methods and techniques to improve the reliability, level, and quality of the conducted research. Finally, the research has proposed a set of recommendations for management science and practice based on the results obtained, including the importance of presenting recommendations that relate to economic realities and reflecting on the limitations of the research to propose the possibility of further research.

After conducting the proper tests, it is necessary to interpret the obtained results and draw conclusions. It is also important to include the following:

- Discussion in the context of the theoretical model – To what extent do the results of the study align with the existing literature and confirm the theory, and what new insights do they contribute to the theoretical model? Additionally, what elements should be added to the theoretical model based on these findings?
- To describe the limitations of the study, there are three primary groups of constraints that need to be considered. Firstly, there are the limitations concerning the research design. Secondly, there are limitations concerning the research sample, which encompasses the size and characteristics of the participants in the study. Finally, there are limitations that concern the operationalisation of the variables, which involves defining the variables, measuring them, and analysing the results. According to Carton and Hofer (2006), these three groups of limitations are important to consider when evaluating the findings of the study;
- Indications of the rationale for the conducted research – the most common indications are the rationale for theory and the rationale for economic practice;
- Set directions for further research – the conducted research does not close the topic, and most often opens the field for

further discussion. In this section, it is important to note what else can be researched in the area and what additional, more focused research may still be done using the results already collected.

The selection of the research design, development of the research model, and choice of research methods depend on the nature of the research.

Due to the limitations of the research sample in the realm of reaching a large group of organisations that could constitute a representative research sample, research is usually conducted on a random sample. Therefore, the procedure for selecting methods and organisations for a given research process should be developed and verified.

A procedure for purposive sampling in an organisation should be developed.

A procedure should be developed to test the validity of using a survey tool to measure a phenomenon in an organisation.

Mistakes made by researchers in research processes are as follows:

- Lack of proper focus on the appropriate testing procedure;
- Lack of use of diverse research methods;
- Lack of availability of a suitable research subject conditioning the choice of specific methods;
- Inadequate selection of research methods and techniques;
- Economic constraints that reduce the breadth and scope of possible studies;
- Lack of familiarity with the broad spectrum of available research methods and techniques, resulting in the inadequate selection thereof;
- Lack of scientific-utilitarian verification of the research methods and techniques used;
- Poor applicability of the obtained research results;
- Erroneous assumptions made in the research process (construction of research questions, objectives, theses, and hypotheses);
- Not having a recipient of the obtained results in terms of the scope of the material studied;
- The divergence of treatment between theoretical and practical approaches;
- Lack of cooperation with business entities at the stage of creating the research process;
- Lack of reliable measures and their use every year, which would also make it possible to check the replicability of the results of the conducted surveys, thus determining the universality of the measures that emerged.

The traditional hierarchical model of company structure has, up until now, consisted of a collection of departments that, despite having a clear goal for the entire enterprise, decide on their own courses of action. Nowadays, knowledge is valued highly and simple, networked, and orbital structures are sought. Equipping both theorists and practitioners with innovative methods and research techniques seems reasonable in order to facilitate the transfer of knowledge to the enterprise, increase the competitiveness of its management in the market, and implement new strategies for the development of the market economy, such as Industry 4.0. This triggers the need for a permanent search for changes in the organisation, taking into account the life cycle theory, as well as teleological and dialectical theories. Despite the accelerating technical and technological progress, man and his abilities still remain a strategic resource of the enterprise.

There is nothing more practical than a good theory – this generalisation, however, does not harmonise with the expressed conviction of exaggerated theorising in management science, its detachment from current managerial practice or the low level of usefulness of research results for the economy. Extreme assessments usually have little justification, so it is difficult to agree with such criticism as well. Raising

the quality of research in the management sciences becomes a necessity in response to the challenges of civilisation, which are determined by the quality of management science research for the economy, the introduction of the so-called Bologna system to higher education, preferring three levels of study – bachelor's, master's and doctoral, with a preference for dual studies and implementation doctorates. The transfer of sophisticated research methods used in world-class publications, which use formal econometric and statistical apparatus whose value is to provide measurable knowledge for practice, results in an increase in methodologically sophisticated research papers. They are up-to-date and in line with world methodological standards, both in the sense of the direction of research inquiry and choice of methods, as well as in terms of an awareness of their limitations.

The author assumed that methodology is meant as the science of methods, which takes inventory of the methods of the research procedure, describes how they are applied, and characterises the advantages and disadvantages of application to research problems. In the 21st century, its modern approach was introduced to the methodology of management science. Existing methods and techniques have gained methodological added value.

Conclusions

The research results provide valuable insights for developing recommendations for integrating management science and practice. The survey of 401 theoreticians and 196 practitioners suggests that verifying developed methodologies, models, or procedures is essential before combining science and practice. Case studies can be used as a thorough method for analysing the research problem, and group expert evaluation is fundamental in verifying the direction of the research. In terms of research methods, the most popular ones are observation, interview, documentary analysis, survey, and group expert evaluation. Additionally, both the observation of ongoing research under natural conditions and observation-interventions are crucial for obtaining relevant information, with researchers having a direct influence on decisions made. The contributions of the research to the literature are twofold. Firstly, the results emphasise the significance of practical methodology for selecting methods and approaches that impact the research process and the efficiency of the organisation. Secondly, the study highlights the importance of choosing suitable methods and approaches in management science research to enhance the dependability, level, and quality of the research carried out.

The empirical implications of this article focus mainly on answering the research questions posed, where the following were found:

- Case studies in research procedures should be used to support qualitative methodologies;
- Verification of the methodologies, models, or processes created is necessary before fusing management science and practice;
- The case study offers the chance to analyse the research problem in depth;
- The primary method for confirming the direction of the research being done should be group expert evaluation;
- In order to conduct research in the management sciences using the observation of facts and following the classification of inductive sciences in general methodology, it is essential to utilise both observations conducted under natural conditions and observation-intervention;
- Generating recommendations for management science and practice based on research findings enhances the standards of both science and practice.

Additionally, by involving scientists and practitioners in the research, the author has learned that it is challenging to select only

one approach that would deliver a comprehensive and in-depth recognition of the problem under study. On that basis, using diverse techniques that will offer a thorough solution to the problem at hand is essential. It is also agreed, at this point, to emphasise the necessity of using practical methods in the research processes. They provide full knowledge of the facts, and thus organise the classification applied in the general methodology where induction is used. The presented statements are also affirmed by the findings of Bryman (2006). Mixed research is widely used only in some disciplines, whereby American publications dominate in that domain. Considering other studies in this area (including those by Kaushik and Walsh (2019) and Bryman and Harley (2018)), one can say that mixed methods are well established in management, but at the same time the authors underline that they still leave room for improvement. We accept the drawbacks of the study process that were mostly brought about by the choices we took in terms of the methodological approach. First, due to the limitations of the research sample in the realm of reaching a large group of organisations that could constitute a representative research sample, research is usually conducted on a random sample. Therefore, the procedure for selecting methods and organisations for a given research process should be developed and verified. Second, due to the lack of cooperation with business entities at the stage of creating the research process.

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