



Market Forces

Volume 21, Issue 1

ISSN: 1816-8434(Print), 2309-8660 (Online)

Home Page: <https://kiet.edu.pk/marketforces/index.php/marketforces>

DOI: <https://doi.org/10.51153/mf.v2i1.721>

Title: Instrumentation in Management Sciences Research: A Focus on Questionnaire Items Development

Affiliation:

1.Olajide Idowu Okunbanjo; Department of Business Administration, faculty of Management Sciences, Lagos State University, Ojo, Nigeria

Kayode Babatunde Afolabi; Department of Business Administration, faculty of Management Sciences, Lagos State University, Ojo, Nigeria

Toheeb Olayemi Abdulganiyu; Department of Business Administration, faculty of Management Sciences, Lagos State University, Ojo, Nigeria

Manuscript Information: Retrieved: January 01, 2026. Revised: May 19, 2026. Accepted: May 28, 2026. Available online: June 28, 2026

Citation:

Okunbanjo, O.I., Afolabi, B.K., & Abdulganiyu, O.T. (2026). Instrumentation in management sciences research: a focus on questionnaire items development. *Market Forces*, 21(1), 27-44.

Copyright:

This article is open access and is distributed under the terms of Creative Commons Attribution 4.0 International License.

1. Copyright of all the submissions to the Market Forces will remain to the contributors.
2. Anyone can distribute, remix, tweak, and build upon his/her work, even commercially, as long as it is credited/cited to the original contributors of the Market Forces.

Conflict of Interest:

The author (s) declared no conflict of interest and have not received any funds for the project.

Instrumentation in Management Sciences Research: A Focus on Questionnaire Items Development

Olajide Idowu Okunbanjo¹

**Department of Business Administration, Faculty of Management Sciences,
Lagos State University, Ojo, Nigeria**

Kayode Babatunde Afolabi

**Department of Business Administration, Faculty of Management Sciences,
Lagos State University, Ojo, Nigeria**

Toheeb Olayemi Abdulganiyu

**Department of Statistics, Faculty of Sciences,
University of Lagos, Nigeria**

Abstract

The heart of survey research lies in the research instrument used. A questionnaire is one of the most widely used research instruments in management science research. However, its development has become a concern for researchers in management sciences. It has been observed that there are challenges in developing a questionnaire, as well as the steps involved. Based on this, the paper explored the development of instrumentation in management sciences research, with a questionnaire as the focus. The study adopted a qualitative research approach with interpretivism as the research paradigm. Content analysis was adopted due to the nature of the paper. The paper reported that questionnaire item development did not follow appropriate steps in most management science research. It was concluded that appropriate steps must be followed: The Conceptualization Stage, Items Generation Stage, Construction Stage, and Evaluation Stage (CICE). The paper therefore recommended that the Conceptualization Stage, Items Generation Stage, Construction Stage, and Evaluation Stage (CICE) be adopted when formulating a questionnaire for management sciences researchers. The questionnaire items should be developed in line with the variables adopted as measures

¹Corresponding Author: Olajide Idowu Okunbanjo. Email: babsafo@gmail.com

of the construct of interest.

Keywords: *Instrumentation, questionnaire, questionnaire development, Management Sciences.*

Introduction

Proffering a solution to an issue or problem in an organization requires certain steps or processes. The steps or processes are done through research. Research has been the approach employed to identify the cause(s) of an organizational problem(s) as well as the solution (Elegunde et al., 2024). According to Aithal and Aithal (2020), research is the process of employing scientific and systematic approaches to answer a question by formulating and testing hypotheses, collecting data, analyzing it to conclude, and generalizing those conclusions. Therefore, instrumentation aids the search for answers to the research problem. Instrumentation refers to the tools used to conduct a research study and answer the formulated research questions arising from the identified problem or gap (Sharma et al., 2020). Instrumentation aids a research study to identify the scope and limitation(s) of the research study (Khairuddin et al., 2018). Instrumentation aids in conducting quantitative research studies, especially those that are survey- or descriptive-based, as well as qualitative and mixed research approaches (Pentang, 2023). Khairuddin et al. (2018) stated that instrumentation comprises several statements used to measure a research subject. It applies to both descriptive and inferential statistical analyses, as well as to parametric and non-parametric methods.

Instrumentation is the heart through which researchers achieve their research objectives (Khairuddin et al., 2018; Goldstein, 2012). It provides many options for researchers to adopt. Thus, studies such as Taherdoost (2022), Aithal and Aithal (2020), Carpenter (2018), Khairuddin et al. (2018), Pozzo et al. (2019); Hsu and Sandford (2012), Glasow (2005) mentioned that instrumentation of a research study is also the same as the research instrument used to solicit data. Instrumentation, therefore, refers to the research instruments that a management sciences researcher employs, including questionnaires, interviews, annual reports, focus groups, observations, and traffic counts. As stated by Pozzo et al. (2019), management science researchers have many options for selecting research instruments to collect data from target respondents. Taherdoost (2022) posited that the choice of a research instrument should be based on the problems or challenges that a researcher intends to cover. Every instrument is suitable for addressing a problem identified by management science researchers (Ranganathan & Caduff, 2023). Instrumentation facilitates the easy collection of data from individuals, groups, entities, and/or companies. Thus, for this study, the questionnaire, as an element of instrumentation, is the focus.

According to Khairuddin et al. (2018), a questionnaire is a commonly used instrument for data collection in management sciences. Rahi (2017) believed that a questionnaire is the most powerful and essential instrument for management and social sciences research. It is constructed on purpose. Kalkbrenner (2021) noted that questionnaire development requires conceptualization, item generation, and consideration of item sequences and the suitability of wording and length. Ranganathan and Caduff (2023) pointed out that if the fundamentals of questionnaire development are faulty, poor research findings may result. Thus, there is a need for researchers in the field of management sciences to understand the fundamentals of instrument development, which motivates this study.

Statement of the Problem

A questionnaire plays a significant role in collecting data for a research study. Therefore, its development requires careful attention to avoid spurious results that could undermine the study's objectives. Despite the importance of questionnaires in management sciences research, the design and item development are inconsistent with proper practices (Taherdoost, 2021). Question wording, question order, and question presentation are among the fundamental issues in questionnaire development for management sciences research studies (Song et al., 1999).

Taherdoost (2022) stated that challenges faced by management science researchers in developing questionnaires could lead to inappropriate and biased findings. According to Pozzo et al. (2019), questionnaires are sometimes applied in an ill-founded and unreflective way in the field of management sciences. Song et al. (2015) believed that relying on existing questionnaires without testing them is among the issues that lead to problems in questionnaire development. Sidhu, Singh, and Kathuria (2015) pointed out that most management science studies do not consider indicators for the constructs they examine. Pentang (2023) submitted that inappropriate or poor development of instrumentation results in inaccurate and compromising research findings, as well as limits the usefulness of the research. Contextual observation shows that researchers in management sciences use existing questionnaires without considering the environmental factors. Also, the items in the questionnaire do not serve as appropriate indicators or measures of the variables used in the research objectives. This is what Krosnick and Presser (2009) refer to as the mapping or matching process. Furthermore, most management science researchers develop questionnaire items by overlapping variables within a single statement. Another faulty approach is for management science researchers to construct items by stating how the variables are important, rather than by specifying the components of those variables. All these issues and challenges result in misinterpretation, bias, and reduced power of the study. Thus, this serves as the

motivation for the paper.

Objectives of the Study

The objective of the study is to explore instrumentation in management sciences research, with a focus on questionnaires. Specifically, the study wants to:

- i identify perceived factors that affect questionnaire items development in management sciences research
- ii assess how questionnaire items could be developed in management sciences research

Literature Review

Conceptual Review

Instrumentation

Instrumentation refers to the tools, methods, or procedures employed by researchers to collect data to achieve the objectives of a research study. (Pentang, 2023; Babbie, 2016). According to Creswell (2014), instrumentation refers to the research instrument used to collect data from the target population sample. It is a germane part of the research process which can directly or indirectly affect the reliability and validity of the data collected from the respondents. Instrumentation is the template used to elicit the information needed to answer the research questions of a study (Creswell & Clark, 2017). It is used in both primary and secondary sources of data collection. Thus, the study sees instrumentation as the specific research instrument(s) used by researchers to collect data from the target respondents. The questionnaire is the study's focus as an instrument.

Questionnaire as an Instrumentation in Management Sciences Research

A questionnaire is a device or instrument, adopted or adapted, that includes a set of questions to elicit answers from the target respondents (Taherdoost, 2021). A questionnaire is a simple list of items or statements presented as questions that can be printed or distributed via a Google Form to the target respondents (Taherdoost, 2017). It is a systematic document or form that contains a set of questions on the subject of interest, prepared to elicit information from a specific group of individuals (Oosterveld et al., 2019). A questionnaire is a document containing questions about a research issue, which is completed by the target respondents (Annum, 2017). A questionnaire is a research instrument that is cheap and quick to employ in management science researchers (Eaden et al., 1999). It is relatively easy to construct, adapt, and adopt. It can be used to collect qualitative and quantitative data (Taherdoost, 2021).

According to Yaddanapudi and Yaddanapudi (2019), a questionnaire is essential and effective for ascertaining respondents' views. The effectiveness of a questionnaire starts from the formulation stage to the administration stage (Ranganathan & Caduff, 2023). This is why its development is essential. A questionnaire can be attractive and interesting to respondents when well developed, as noted by Davis (1996). Therefore, developing a questionnaire is the first step toward ensuring the credibility and quality of the data to be collected from respondents. Studies such as (Ranganathan & Caduff, 2023); Taherdoost (2021); Aithal & Aithal (2020); Yaddanapudi & Yaddanapudi (2019); Tahaerdoost (2017); Annum (2017); Creswell & Clark (2017). Glasgow (2005), among others, posited that questionnaire development could take two forms: open-ended and closed-ended questionnaires.

Closed-ended Questionnaire

A closed-ended questionnaire is also called a structured questionnaire because its questions are developed in a structured manner (Taherdoost, 2021). This is when a questionnaire is developed by restricting respondents' responses to specific rating scales. It is a developed questionnaire that allows the respondent to choose from the rating scale given by the researcher(s). The nature of the questionnaire requires that responses fall within the rating scale options. Anuum (2017) explained that respondents are required to carefully examine the provided rating scale before selecting their responses. This type of questionnaire is easier for respondents to answer and for researchers to analyze. Based on the aforementioned, this paper views a questionnaire as an instrument for measuring one or more concepts, constructs, and/or variables, using aggregated statements as items to achieve research objectives.

Questionnaire Development

Questionnaire development is the process of constructing items or statements for a questionnaire to be administered to the target respondents. Oosterveld et al. (2019) defined questionnaire development as the process of constructing a variable's measurement. It is the approach used to develop items that measure a variable in a research objective (Irwing et al., 2018). Clark and Watson (2019) pointed out that questionnaire development is aided by scientific journals, textbooks, field assessments, documented reviews, practitioners' opinions, and theories, and that it requires stages.

Pentang (2023) and DeVellis (2017) argued that there are stages in designing instrumentation, such as questionnaires, in the field of management sciences: the planning, construction, and evaluation stages.

Planning Stage:

This is the stage in which a researcher defines the constructs, concepts, and/or variables of interest. According to Devellis (2017), the planning stage is when researchers develop the conceptual model of the variables used to address the study's objectives, showing how they are related to one another. At this stage, the type of data to be collected must be identified, whether it is going to be nominal, ordinal, interval, or ratio data.

Construction Stage

This is the stage in which a researcher identifies the items that will serve as measures of the constructs and/or variables employed in the study. This is the stage where items will be constructed to measure and match a variable without any overlap. According to Fowler (2013), researchers should construct a questionnaire aligned with the variables employed.

Evaluation Stage

This is the stage where the items in the questionnaire will be assessed to determine the instrument's viability. This is the stage in which the researcher will test the questionnaire to determine whether respondents understand it and whether it accurately measures the variables relevant to the study's objectives (DeVellis, 2017). According to Pentang (2023), the evaluation stage assesses the questionnaire's readiness to achieve the study's objectives. At this stage, the instrument's reliability and validity will indicate whether it can be used in the study.

According to Oosterveld et al. (2019), questionnaire development or design involves four stages: conceptual analysis, item production, scale construction, and evaluation.

Conceptual Analysis

This is the first stage of questionnaire development. It is the definition stage, drawing on the operational concepts or constructs of the research and the theoretical definitions of the concepts or constructs of interest. The researcher's ideas or meanings regarding the concepts or constructs will be expressed, implying working definitions of the constructs. It is the conceptualization stage.

Items Production Stage

This stage involves sourcing materials such as journals, articles, reports, textbooks, interviews, and reviews on the concepts and their conceptualization. Items for the questionnaire are gathered and pooled in line with the specifications of the first stage, which is the conceptual analysis. At this stage, items to be adapted and/or adopted are ascertained.

Scale Construction Stage

This is the stage where the source materials for the questionnaire items are developed into logical statements. This stage involves a rational method, in which intuitive and informal approaches are adopted. At this stage, item construction must be specific and in line with the conceptualization.

Evaluation Phase

This is the final stage of the questionnaire development according to Oosterveld et al. (2019). This is the stage where the constructed items will be reviewed and tested. This stage requires that the questionnaire undergo a pilot test to assess the research instrument's validity and reliability. Thus, the evaluation phase ensures standardization of the questionnaire items.

Determinants of a Good Questionnaire

Several authors have identified factors that determine a good questionnaire in the management and social sciences (Panteng, 2023; Taherdoost, 2022; Diersch & Walther, 2016). Consider cultural or linguistic differences (Fowler, 2013). These factors include the use of clear and concise language; feasibility and ethical considerations; avoidance of loaded questions; pilot testing; and consideration of cultural or linguistic differences, among others.

The Use of Clear and Concise Language: A researcher must employ language that is easy for respondents to understand. The chosen language must be easy to understand and free of technical jargon or complex terms.

Feasible and Ethical: A good question, as mentioned by Glasow (2005), must be feasible to answer, and respondents must be willing to answer it. Questions must be civil and ethical. The questionnaire must not contain measurement items for which the respondents do not have answers. The questionnaire items must be solely on the subject of interest.

Avoidance of Loaded Questions: A good questionnaire must avoid loaded questions. The items for the variable measures must not be long and must not be loaded. According to Glasow (2005), incomplete statements and statements that could lead to misinterpretation should be avoided.

Conducting a Pilot Test: In developing a questionnaire, a pilot test is an important step. This is when the items in the questionnaire are tested with a small sample to identify where adjustment will be necessary.

Consideration of Cultural or Linguistic Differences. Researchers need to be mindful of differences in respondents' cultures or languages in the study. The items used to measure the variable of interest must be appropriate and relevant to the population being studied.

However, Eaden et al. (1999) noted that when developing a questionnaire, questions or items irrelevant to the subject of interest should be avoided. The questions or items should not be ambiguous. According to Taherdoost (2021), Kabir (2016), and Olsen (2012), simplicity, brevity, clarity, asking one question at a time, avoiding suggestive questions, ordering questions, and avoiding assumptions about respondents are among the factors that determine the effectiveness of questionnaire development. Taherdoost (2022) added scaling as one of the factors to consider when developing questionnaire items.

Review of Past Studies on Questionnaire as an Instrument

Carpenter (2018) studied the ten steps involved in the development and reporting of a scale. The author focused on exploratory factor analysis in the field of communication and noted that factor analysis had been misused in scale development. It was posited that scale development should be a practice in the communication discipline. Pozzo et al. (2019) examined how questionnaires are used at a university. The paper examined questionnaires as a methodological strategy and concluded that survey research contains an element of bias. The studies failed to focus on how questionnaires are developed in management sciences research, but on the screening of items.

Khairuddin et al. (2018) examined the philosophy of instrument development and its history in social science research. The paper states that inappropriate instrument development will render the entire study worthless, affecting all significant factors. The study was not conducted from a Nigerian perspective and did not focus on management sciences. Taherdoost (2022) presented a guide to designing an effective questionnaire. The author concluded that defining the required information for the research study, identifying the type of survey, and identifying and building the construct are among the steps for effective questionnaire design. Despite focusing on questionnaire design, the study was not specific on which discipline should undertake the ten steps, and it was not centered on the Nigerian environment. Davies (1996) concluded in his investigation of the process of instrumentation that questionnaire items should be accurately measurable, and that the instrument should be tested for content and clarity by its target group. However, the study focused on medical sciences. Taherdoost (2019) reported that the attitude scale should be used in questionnaire design, with a focus

on the Likert scale. Kalkbrenner (2021) explored instrument development with score validation in the social sciences. The paper introduced an approach called MEASURE for developing an instrument and posited that MEASURE, which serves as an acronym for the seven steps in instrument development. The study did not concentrate on a specific field.

Aithal and Aithal (2020) conducted a systematic review on the development and validation of a questionnaire. The paper provided guidelines and a framework for developing questionnaires in the management and social sciences. The paper sheds more light on the data collection. Bihu (2021) investigated survey methodology, focusing on questionnaires in educational and social sciences studies, and reported that questionnaires, as a research instrument, have contributed significantly to the success of various studies. The study failed to see how the items in the questionnaire were developed in the field of management sciences.

Methodology

The paper is not a scientific research study, which makes its nature qualitative research. The research paradigm is interpretivism. This paradigm was adopted because the paper is grounded in the researchers' experiences and knowledge, reflecting the socially conceived reality. The paper adopts epistemology as its research philosophy because of the study's intended aims, which align with assumptions about knowledge in questionnaire development. The study employed observations informed by past studies on the subject. The paper employed qualitative content analysis to examine the development of questionnaire items in management science research.

Discussion of Findings

Scaling is important for the ranking of respondents' opinions on a particular subject. Researchers have established a vast array of scaling formats in different fields of study. Royal et al (2020) indicated that scaling options cannot be strictly standardized in a research instrument. The scaling options, irrespective of the field of study, do not adhere to strict uniformity and often vary greatly; for instance, a dichotomous scale (Yes and No), a trichotomous scale (Yes, Maybe, and No), and agree, neutral, and disagree. All these belong to different types of scaling, as extensively discussed in the literature.

The heart of a survey study is the process of data collection, which involves instrumentation, specifically a questionnaire. It is worth noting that questionnaires can be structured or unstructured, also referred to as closed-ended and open-ended questionnaires.

The structure of the research questions and the nature of the subject of interest

determine the form of a questionnaire. A research question with no independent variable(s) or dependent variable(s) can be appropriately answered using an open-ended questionnaire because respondents are permitted to give their opinions on the subject matter. An open-ended questionnaire paves the way for the respondents to give responses out of the context(s) of the research scope, which may make the research objectives difficult to achieve. This does not bring complete uniformity to the respondents' responses. According to Juster and Smith (1997), an open-ended questionnaire leads respondents to answer questions they are unsure of, thereby diverting the focus of the research study and making analysis difficult.

In the field of management sciences, research is conducted when the challenges that lead to the organizational problems are identified; thus, independent variable(s) and dependent variable(s) are identified to form the research question(s). This will make it inappropriate to use an open-ended questionnaire. Therefore, the items in the closed-ended questionnaire must align with the variables used in the study's objectives. One perceived error in developing questionnaire items in management sciences research is constructing items that reflect the study's objectives rather than aligning with the variables or concepts used to achieve those objectives. Variables are measures of the concepts a study in management sciences intends to examine, and they represent what the study aims to achieve. Thus, items that can serve as measures must be developed.

Items for measuring a concept like career development should be statements that assess it in both theory and practice. An example of appropriate measures for career development should read "my employer invests in professional development; my employer trains the new and existing employees; and my employer creates a platform for career goal(s) setting and its attainment". These are appropriate measures for a career development concept. In most management science studies, a concept like career development is measured by its outcomes rather than by what it is about. Examples of the incorrect measures are "career development enhances my performance in my organization", career development aids employee commitment; and there is career development in my organization ". This is an additional table for clarity.

Table I shows that the items are considered measures of the variables of interest. Three items were used to measure the variables adopted in the study. The appropriate items for the variables are more direct and tend to describe the concepts of interest. This

Table 1: Concepts and Items Construction

Concepts	Appropriate Measures (Items)	Inappropriate Measures (Items)	Index Items
Career Development	My employer invests in professional development My employer trains the new and existing employees My employer creates a platform for career goal(s) setting and its attainment	Career development enhances my performance in my organization Career development aids employee commitment There is career development in my organization	• Professional Development • Training • Personal Goals Setting
Employee Performance	I complete the tasks assigned to me at the appropriate time I am committed to the organization. Individual tasks assigned to me There is improvement in the manner or approach I execute the tasks assigned to me.	Employee performance increases aid the overall performance of the organization Career management contributes to Employee performance in my organization Employee performance is important in line with stated objectives	• Task Completion • Task Commitment • Approach Improvement
Organisational Structure	Some rules and regulations guide operational processes in my organization All units are making decisions in my organization My organizational activities are in line with the ethics in the industry.	Organizational Structure enhances operational processes in my organization Organizational structure aids professional conduct in my organization Organizational Structure is simple in my organization.	• Formalisation • Decentralisation • Professionalism
Entrepreneurial Culture	Unique ideas are always encouraged in my organization Employees are given the freedom to display their entrepreneurial mindsets. There is a high rate of renewal in organizational processes, procedures, and techniques in my organization.	There is an entrepreneurial culture in my organization My organization emphasizes an entrepreneurial culture Entrepreneurial culture determines our performance in my organization	• Innovation • Autonomy • Operational Renewal

Job Determination	I display perseverance in the execution of tasks	I am determined to do the tasks assigned to me	• Perseverance
	I develop a sense of conscientiousness when discharging my responsibilities	Job determination aids my performance	• Conscientiousness
	I can make the best out of difficulties	Job determination assists in achieving organizational objectives	• Resilience

implies that items used to measure a variable or concept in the questionnaire have to reflect what the concept is about, its features and perspectives, as well as its dimensions. The items for career development, employee performance, organizational structure, entrepreneurial culture, and job determination, under the appropriate item column, explain what the variables are, why they are called what they are, and what they mean.

The column for inappropriate items in the above depicts what the concepts do in an organization. The activities of the concepts are used as items, not the concepts' descriptions. The items do not explain what the concepts- career development, employee performance, organizational structure, entrepreneurial culture, and job determination are all about, but rather the results of using the concepts. According to Taherdoost (2022), questionnaire development should include a description of the variables used to help respondents understand what the variables are meant to measure. Questionnaire item development means that items used as measures of variables are expected to capture the characteristics, components, and elements of the concepts employed in a research study.

It should be noted that the items in a questionnaire can serve as indices for the variables of interest. This implies that a word could represent an item used to measure a variable in the questionnaire. As shown in the third column of Table 1, the appropriate items could be codified into a word or set of words to measure the variable of interest. It is observed that, in questionnaire development, a variable can be a measure of a concept or a sub-variable, which can also be the items used for measurement.

Taherdoost (2021; 2022) asserted that item development for a questionnaire requires specific steps. The steps postulated by different authors; i.e. Kalkbrenner (2021), Oosterveld et al. (2019), and Ng (2006) are relatively different but have the same content. Taherdoost (2022) identified the following steps as critical for developing a questionnaire: identifying information needs; selecting the survey type; selecting the question type; writing the questionnaire; organizing, pre-testing, and finalizing. Pentang (2023) and DeVellis (2017) grouped the steps involved in design into three stages: The planning stage, the construction stage, and the evaluation stage.

Kalkbrenner (2021) developed an approach called “The MEASURE”. The author used the first letter of the identified steps to form the acronym. MEASURE implies: (a) Make the purpose and rationale clear, (b) Establish an empirical framework, (c) Articulate a theoretical blueprint, (d) Synthesize content and scale development, (e) Use expert reviewers, (f) Recruit participants, and (g) Evaluate validity and reliability. In line with the aforementioned, the current paper holds that the development of questionnaire items begins with the first step after the problem to be solved has been identified. Thus, the following are proposed as steps involved in questionnaire development: Identification of the variable of interest; ascertaining the meaning of the variable of interest; conceptualizing the variable of interest; searching for past studies' instrumentation on the variable of interest; selection of items that describe the variables of interest; construction of items in line with the conceptualization; Organising the items; and testing the instrument. The paper therefore groups these stages into FOUR: “Conceptualization Stage, Item Generation Stage, Construction Stage, and Evaluation Stage”. These steps are abbreviated as CICE. CICE is presented in the figure below as a framework for developing questionnaire items.

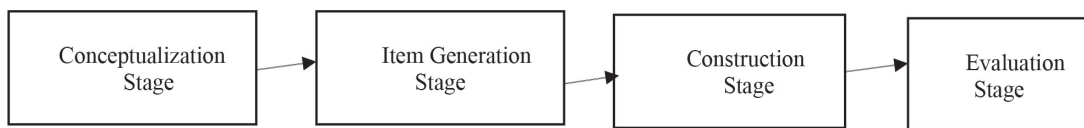


Figure 1: Stages in Questionnaire Development

The conceptualisation stage (identifying the variable of interest; ascertaining the meaning of the variable of interest); item generation stage (searching for past studies instrumentation on variable of interest and selecting the items that describe the variables of interest), construction stage (developing the items in line with the conceptualisation and organising the items) and evaluation stage (testing the instrument's validity and reliability and reviewing). The proposed steps in this paper for developing questionnaire items for management sciences research are in line with other studies (Taherdoost, 2021; 2022; Kalkbrenner, 2021; Ng, 2006) on the subject. The acronym ‘CICE’ is a relatively expanded version of the questionnaire development steps outlined in the studies by Pentang (2023), Oosterveld et al. (2019), and DeVellis (2017).

Conclusions

A questionnaire is an instrument used in management science research. It has been adopted by most studies on organizational challenges and/or problems. This paper has explored the concept of instrumentation, viz-a-viz questionnaire, as it is adopted in the field of management sciences research. Instrumentation is a critical stage in

research methodology, and the questionnaire is the most widely adopted instrument used by management sciences researchers to collect information to solve the identified organizational problem(s) and fill gaps in the literature. The paper pointed out that item development for the questionnaire should align with the variables in the study's objectives. The construction of statements as items in the questionnaire needs to be concise, simple, and easy for respondents to understand.

The paper used constructive theory because of its epistemology. The steps proposed in this paper for questionnaire development are built on the existing step pattern outlined in prior studies. This implies that theory could be used to develop questionnaire items for management sciences research. Theory could serve as a prerequisite for standard item development in questionnaires for management sciences research.

Therefore, it is imperative to note that this paper's perspective does not come from teaching but from personal reflection, research, learning, observation, and experience, which is why a constructive theory is adopted. The study concluded by proposing the conceptualization stage, item generation stage, construction stage, and Evaluation stage (CICE) as an appropriate approach to developing a questionnaire for management sciences research. Thus, extending the frontier of knowledge. Also, the formulation of questionnaire items to reflect the objectives of the study and the inappropriate adoption of a questionnaire without considering environmental factors are major challenges to questionnaire development in management sciences for research purposes.

Based on the paper's conclusion, the paper therefore puts forward the following recommendations: management sciences researchers should take note of simple language, avoid loaded questions, and consider linguistic differences when developing questionnaire items. Questionnaire items should be developed in line with the variables specified in the study's specific objectives. Also, Conceptualization Stage, Item Generation Stage, Construction Stage, and Evaluation Stage, which are known as CICE, should be adopted when developing questionnaire items for management sciences researches

Reference

- Adom, D., Yeboah, A., & Ankrah, A.K. (2016). Constructivism philosophical paradigm: implication for research, teaching and learning. *Global Journal of Arts Humanities and Social Sciences*, 14(10), 1-9.
- Aithal, A., & Aithal, P.S. (2020). Development and validation of survey questionnaire & experimental data – A systematical review-based statistical approach. Retrieved from <https://mpr.ub.uni-muenchen.de/104830/> at 22/2/2024
- Annum, G. (2017). Questionnaire design. Retrieved from http://campus.educadium.com/newmediart/file.php/1/giilmadstore/UgradResearch/acaResearch_index.htm as at 22/2/2024
- Bihu, R. (2012). Questionnaire survey methodology in educational and social science studies. *International Journal of Quantitative and Qualitative Research Methods*, 9(3), 40-60.
- Carpenter, S. (2018). Ten steps in scale development and reporting: A guide for researchers. *Communication Methods and Measures*, 12(1), 25-44,
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approach*. Sage publications.
- Creswell, J. W., & Clark, V. L. (2017). *Designing and conducting mixed methods research*. Sage publications.
- Davis, A. E. (1996). Instrument development: getting started. *Journal of Neuroscience Nursing*, 28(3), 204-214.
- DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Sage publications.
- Diersch, N., & Walther, E. (2016). The impact of question format, context, and content on survey answers in early and late adolescence. *Journal of Official Statistics*, 32(2), 307-328. <https://doi.org/10.1515/jos-2016-0018>.
- Eaden, J., Mayberry, M.K., & Mayberry, J.F. (1999). Questionnaires: the use and abuse of social survey methods in medical research. *Postgraduate Medicine Journal*, 75, 397–400.
- Elegunde, A.F., Okunbanjo, O.I., & Afolabi, B.K. (2024). Scaling in quantitative survey in management science research: The perspective of likert scale. *Technical University of Varna Annual Journal*, 8(2), 21-32
- Fowler, F. J. (2013). *Survey research methods* (5th ed.). Sage

- Glasow, P. A. (2005). Fundamentals of survey research methodology. *Retrieved January, 18, 2013.*
- Goldstein, H. (2012). Measurement, psychometrics and social progress. *Assessment in Education: Principles, Policy & Practice, 19*(2), 147–158. .
- Hsu, C.-C., & Sanford, B. A. (2007). The delphi technique: making sense of consensus. *Practical Assessment Research & Evaluation, 12*(10), 1–8.
- Juster, F. T., & Smith, J. P. (1997). Improving the quality of economic data: lessons from the HRS and AHEAD. *Journal of the American Statistical Association, 92*, 1268-1278.
- Kalkbrenner, M. (2021). A practical guide to instrument development and score validation in social sciences research: The measure approach. *Practical Assessment, Research & Evaluation, 26*(1), 63-77.
- Khairuddin, K. N., Omar, Z., Krauss, S. E., & Ismail, I. A. (2018). A brief review of the history and philosophy of instrument development in the social sciences. *International Journal of Academic Research in Business and Social Sciences, 8*(9), 1517–1524.
- Krosnick, J. A. (2018). *Questionnaire design the palgrave handbook of survey research*. Springer: New York.
- Krosnick, J. A. & Presser, S. (2009). Question and questionnaire design. In *Handbook of Survey Research* (2nd Edition) James D. Wright and Peter V. Marsden (Eds). San Diego, CA: Elsevier.
- Ng, C. J. (2006). Designing a questionnaire. *Malaysian Family Physician, 1*(1), 32-35.
- Oosterveld, P., Vorst, H. C. M., & Smits, N. (2019). Methods for questionnaire design: A taxonomy linking procedures to test goals. *Quality of Life Research (2019) 28*, 501–2512.
- Pentang, J. T. (2023). *Quantitative research instrumentation for educators*. Wesleyan University - Philippines Lecture Series on Research Process and Publication.
- Piaget, J. (1971). *Structuralism*. New York: Basic Books.
- Pozzo, M. I., Borgobello, A., & Pierella, M. P. (2019). Using questionnaires in research on universities: analysis of experiences from a situated perspective. *Review of Innovation Research and Education, 12*(2), 1–16.
- Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economic and Management Sciences, 6*, 403-416.
- Ranganathan, P., & Caduff, C. (2023). Designing and validating a research questionnaire. *Perspective of Clinical Research, 1*, 152-155.

- Sharma, S.K., Mudgal, S.K., Thakur, K., & Gaur, R. (2020). How to calculate sample size for observational and experimental nursing research studies? *National Journal of Physio Pharmacology*, 10, 1-8.
- Sidhu, J.K., Singh, S., & Kathuria, P. (2018). How to design and validate a questionnaire.
- Song, Y., Son, Y. J., & Oh, D. (2015). Methodological issues in questionnaire design. *Journal of Korean Academy of Nursing*, 45(3), 323-328.
- Taherdoost, H. (2017). Measurement and scaling techniques in research methodology: survey/questionnaire development. *International Journal of Academic Research in Management*, 6(1), 1-5.
- Taherdoost, H. (2022). Designing a questionnaire for a research paper: A comprehensive guide to design and develop an effective questionnaire. *Asian Journal of Managerial Science*, 11, 8- 16.
- Tebogo, M. (2014). Applicability of constructivist theory in qualitative educational research. *American International Journal of Contemporary Research*, 4(7), 51-59.
- Yaddanapudi, S., & Yaddanapudi, L.N. (2019). How to design a questionnaire. *Indian Journal of Anaesth*, 6(5), 335-347.