Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

Achieving organizational consensus for the JD-R competency model: A judgmental forecasting system for engaging leadership

Jun Ding [1, 2], Wei Chong Choo [1, *], Ng Keng Yap [3]

[1]School of Business and Economics, Universiti Putra Malaysia, Jalan Universiti 1, 43400 Serdang, Selangor, Malaysia
[2]Marxist Teaching and Research Department, Weifang Nursing Vocational College, Weifang, Shandong Province, China
[3]Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

ARTICLE INFO

Article history:
Received 13 August 2024
Received in revised form
6 February 2025
Accepted 11 March 2025

Keywords:
Online support system
JD-R competency model
Engaging leadership
Organizational consensus
Employee well-being

ABSTRACT

This study develops an online support system tool based on the Job Demands-Resources (JD-R) model and Engaging Leadership theory to facilitate organizational consensus in evaluating and addressing job characteristics. Using a qualitative research design, including document analysis and the online Delphi method, it constructs a JD-R competency model within the framework of occupational health psychology. The study proposes the classical Delphi method to establish consensus and, in cases of disagreement, employs the Policy Delphi method to explore underlying differences. By integrating these methods into a judgment-based forecasting system, the research provides an effective approach for achieving organizational-level consensus. The proposed system supports Engaging Leadership, mitigates burnout, and enhances employee well-being, offering a practical tool for leadership development and workplace improvement.

1. Introduction

In the increasingly competitive market economy environment, employers' demand for human resources shows elasticity and variability, which poses challenges for employees to improve work performance while managing their careers effectively (Segers and Inceoglu, 2012). In this context, employees need to improve their adaptability to face highly uncertain environments, and they also need to maintain a good physical and mental state while facing more challenging work (Vuori et al., 2012). At the same time, many young employees face problems such as low job satisfaction, high job burnout, high work pressure, and high unemployment rates due to their inability to adapt to the new environment and work demands (Akkermans et al., 2009; Akkermans et al., 2013a; 2013b). Therefore, management departments should also help improve employees' occupational health through effective human resource management methods. For example, companies can improve their employees' adaptability to new environments and jobs through performance evaluations and personnel recruitment based on occupational health management goals. Therefore, we plan to establish a competency model based on the job demands-resources (JD-R) model, one of the most popular models in occupational health psychology (Taris et al., 2017), to help organizations promote employee occupational health management. Moreover, this study conducted in-depth research and exploration of the organizational consensus issues involved in the model-building process. The proposal of this study is mainly based on the following aspects of stimulation.

Scholars engaged in JD-R research usually do not know the practical application version of their theoretical study and often take some relatively simple forms in the practical application process (Bakker and Demerouti, 2017). Schaufeli (2017) proposed Energy Compass, a tool for online JD-R assessment, and stressed that it is necessary to develop an effective online system in the next step to provide development support from the organizational level to help employees improve job resources and reduce job demands (Schaufeli, 2017), which is also the aim of Engaging Leadership (Schaufeli, 2015). This study, which aims to establish the competency model based on the JD-R model, was partially inspired by this and proposed in this context. The competency model shows us the competencies required to excel in a specific profession or job position, which human resource

* Corresponding Author.
Email Address: ranlte8852@163.com (W. C. Choo)
https://doi.org/10.21833/ijaas.2025.03.015
Corresponding author's ORCID profile:
https://orcid.org/0009-0002-1106-5718

managers can use to design various applications (Suhairom et al., 2014). Managers can recruit and select based on the templates provided by the competency model. Given the enormous value of competency models for personal development and organizational strategy, competency modelling has developed into a management topic that organizations, experts, and scholars are passionate about researching (Alldredge and Nilan, 2000; Shippmann et al., 2000; Winterton and Winterton, 2002).

However, previous studies have hardly involved competency tools based on the JD-R model. The existing workplace competency measurement tools rarely address this aspect. It is also difficult for us to find relevant research evidence from existing literature. At the same time, researchers advocate using team profiles based on job characteristics for interventions to improve performance and address management issues (Bakker and Demerouti, 2017). Previous studies have shown that JD-R interventions often improve employee well-being (Taris et al., 2003). This study aims to describe the method of establishing a JD-R competency model. We can use the JD-R competency model to help evaluate employees' competency and measure the level of Engaging Leadership. These will be beneficial for Engaging Leadership and promoting employee well-being.

Scholars advocate conducting in-depth research on the measurement of organizational job characteristics, and the measurement at the organizational and individual levels should be treated differently in the study (Bakker and Demerouti, 2017). Previous researchers prefer to measure job characteristics at the organizational level by aggregating average scores at the individual level (Bakker and Demerouti, 2017). However, Bakker and Demerouti (2017) raised questions, stating that it is not appropriate to use a simple average score to represent the levels of the entire team, as this may not avoid the impact of extreme scores within the group. To accurately measure job characteristics at the organizational level, we should form a sufficient consensus among team members (Bakker and Demerouti, 2017). Therefore, finding a suitable method to reach a consensus has become an urgent problem, and this is also the innovation of this study. As one of the best research tools for reaching consensus (Fish and Busby, 1996; Linstone and Turoff, 2011), we considered using the Delphi method.

We propose that building the JD-R competency model and measuring the relevant data are important tasks in measuring job characteristics at the organizational level. Therefore, this study considers reaching organizational consensus as the core link in building the JD-R competency model. Competency has an inseparable relationship with the organization and team. For example, some scholars suggested that organizational enterprise competency is also part of the connotation of competency (Barenji et al., 2013). In addition, some scholars suggested that in addition to personal abilities, it should also include social skills, such as communication skills for interpersonal collaboration (El Asame and Wakrim, 2018). On the other hand, researchers argued that competency is a characteristic value of an organization or team. From the human resource management perspective, the United Nations Industrial Development Organization suggested that competency is a series of skills, features, and knowledge to help people excel in a particular position (El Asame and Wakrim, 2018; Sampson and Fytros, 2008). Therefore, it is reasonable to consider the construction process of the JD-R competency model for specific positions as organizational-level research. At the same time, some scholars point out that the future application of the JD-R model should give more attention to job demands and job resources at the organizational or team level (Bakker and Demerouti, 2017). They emphasized that measuring work characteristics at the team level should be based on whether organizational consensus can be reached (Bakker and Demerouti, 2017). Therefore, building the JD-R competency model shall focus more on reaching organizational consensus.

The Delphi method is very suitable for studying consensus at the organizational level. Linstone and Turoff (2011) argued that reaching a precise collective consensus through the rational operation of collective wisdom was possible, forming the Delphi method's ideological basis. We can use the Delphi method when we are interested in a specific topic in a certain field and want to communicate with experts to reach a consensus (Fish and Busby, 1996). Fish and Busby (1996) argued that the Delphi method provides a method and a bridge for remote communication on specific topics. It saves the cost of face-to-face meetings while also being different from traditional surveys: it is not limited to collecting opinions but can engage in in-depth dialogue on viewpoints through feedback and communication, ultimately reaching a valuable consensus (Fish and Busby, 1996). When we want to reach group consensus or review new research topics, the Delphi method has almost no weaknesses and is a particularly suitable choice (Fish and Busby, 1996). The Delphi method is particularly suitable for reviewing emerging research fields and building expert consensus (Fish and Busby, 1996). Therefore, the Delphi method has become the first choice for this study.

At the same time, we also need to recognize an important message: Delphi can generate consensus, but Delphi's goal is not to generate consensus; it may generate divergence while generating consensus. Linstone and Turoff (2011) argued that there has always been a misconception that Delphi's goal is to confirm consensus. The article repeatedly emphasized that Delphi is a method for constructing a group communication process rather than a pattern to generate consensus. They believe that the final number of rounds in the Delphi process depends on the stability of expert opinions rather

than being based on reaching consensus. At the same time, they emphasize that the views of the final expert group may also end with preserving differences, which is also very valuable and should attract our attention.

Therefore, in exploring organizational consensus, this study distinguishes the results of the Delphi process into two situations: consensus reached and consensus not reached. In the case of reaching organizational consensus, we can propose some applications through the established competency model, such as for assessment and recruitment. In the case of not reaching organizational consensus, we shall give sufficient attention to the differences in views that ultimately emerged from the Delphi method. We use policy Delphi techniques to explore the underlying reasons for non-consensus situations, which will help adopt management measures to intervene.

It has the following contributions to Engaging Leadership. The contribution of Delphi to Engaging Leadership is its ability to provide valuable management reference information through Policy Delphi technology (Seker, 2015). Some scholars point out that competency models can guide managers and employees, helping them understand critical information to improve employee performance and provide behavioral guidance (Suhairom et al., 2014). According to Linstone and Turoff (2011), three measurements of human judgment are considered academic endeavors. One of them is measuring human understanding and judgment to determine how to advance the group's understanding of mental cognition among individuals in a group. In their view, this is precisely the object and problem Delphi is trying to measure and solve.

For example, it can be applied to areas such as visualization and information representation design. They put forward two critical pieces of information: the first is that instead of making a quick subconscious response to the questions raised, they are more concerned about how to try to stimulate the participants to think positively about complex problems; the second is that they try to make people aware of the convergence of knowledge and different perspectives among the participants. When engaging leaders attempt to make people aware of the convergence of knowledge and different views among participants, this is inevitably a process of enhancing connections and exploring problems in greater depth. At the same time, when engaging leaders can motivate participants to think about complex issues actively, it often leads to more valuable conclusions. Therefore, the Delphi method will play a positive role in Engaging Leadership when trying to explore differences, gather ideas, and communicate with each other. Based on the above considerations, we can use Policy Delphi technology to extract critical information for non-consensus situations in the competency model construction process to serve the Engineering Leadership.

Another contribution. The online Delphi system can help develop a mobility and flexibility detection mechanism to understand and adapt to changes in job characteristics in real time, which will help enhance connections with employees and improve Engaging Leadership. According to enacted job characteristics, actual job characteristics in practice are not fixed but tend to be dynamic and constantly changing. Moreover, studies have shown that job demands and resources continuously change daily (Ilies et al., 2015). Researchers also find that everyday working conditions are not fixed and unchanging (Simbula, 2010), and as a result, employees may have different mental states and levels of burnout under different working conditions every day. Consequently, we shall develop a mobility and flexibility detection mechanism to understand and adapt to such changes in real time. The online Delphi system allows a wide range of personnel to participate and interact, making it easy to operate and join at any time (Linstone and Turoff, 2011). These characteristics show its strong potential and advantages: muscular mobility and flexibility. Therefore, evaluating the competency model through the online Delphi system can provide better feedback on the original appearance from the perspective of "enacted job characteristics".

The main research question for this study is to seek answers for:

- What is the JD-R competency model that can help establish an online support system tool based on the JD-R model and the Engaging Leadership theory?
- How do we reach organizational consensus when establishing the JD-R competency model?
- What should we do if we cannot reach an organizational consensus while establishing the JD-R competency model?

2. Literature review

2.1. The job demands-resources model

Since the JD-R model first entered our view in 2001, it has undergone significant development and evolution to date. The impact of the JD-R model is enormous, and many organizations and researchers have benefited from it (Bakker and Demerouti, 2017). Early research on the JD-R model primarily focused on empirical studies related to burnout, intending to explain the reasons for its occurrence (Bakker and Demerouti, 2017). The job demands-resources theory believes that job demands have a negative impact on burnout, while job resources can buffer against such adverse effects. According to the JD-R model theory, job characteristics are defined as a collection of job demands and job resources, which respectively stir up the health-impairment process and motivational process (Bakker and Demerouti, 2017).

2.2. The JD-R model in current organizational contexts

Given the widespread application of the JD-R model, its research in modern organizations has always been a hot topic in academic studies. Tong et al. (2019) studied the unsafe behaviors of Chinese coal miners at the organizational level from the perspective of the JD-R model. Massa et al. (2023) used the JD-R model as the main conceptual framework to study the relevant factors in organizations that may affect employees' attitudes towards remote working and remote productivity. Luo and Lei (2021) used the JD-R model to predict the organizational outcomes of social workers. Ramaci et al. (2024) investigated the role of Perceived Organizational Support when testing the JD-R model in Italian oncology nurses. Albrecht et al. (2018) assessed the significance of proposed associations between organizationally focused resources, organizational engagement climate, and engagement, which suggested that the JD-R may usefully be extended to include more organizationally focused constructs.

2.3. The engaging leadership theory

The Engaging Leadership theory was proposed in 2015 and studied as an antecedent to work engagement (Schaufeli, 2015). It argues that leadership can impact employees' work engagement, as it affects other resources that promote engagement (Rahmadani and Schaufeli, 2019). Striving to improve employees' job resources and reduce their job demands, engaging leaders shall focus on inspiring, strengthening, connecting, and empowering employees, which is the core task of Engaging Leadership (Schaufeli, 2015). When performing these leadership behaviors, they can meet the basic psychological needs of employees and increase their job resources, thereby increasing their engagement (Schaufeli, 2015).

2.4. Competency and competency model

2.4.1. The competency

Competency refers to a series of personal conditions and behavioral characteristics that can directly affect work performance. Since the concept of competency was proposed, much literature and studies have identified competencies that affect management success and employee performance (Chouhan and Srivastava, 2014).

2.4.2. The competency model

There are various opinions on the definition of the competency model. Some scholars propose that the competency model corresponds to organizational positions, intending to help people recognize the competencies required to effectively fulfil corresponding responsibilities or the organization's strategic goals (El Asame and Wakrim, 2018; Sampson and Fytros, 2008). The competency model determines the critical competencies required for employees to perform excellently. The competency model can describe the work competencies required for a specific job position, and depending on the organizational environment, each job typically requires 7 to 9 competencies (Shippmann et al., 2000). Competency models often have observable, valid, and measurable characteristics and are a combination of knowledge, skills, attitudes, etc., that determine excellent job performance (Chouhan and Srivastava, 2014).

2.5. The Delphi method

Delphi was first applied in defense to predict future US security needs. Delphi's philosophical foundation comes from the relevant content in the philosophies of Locke, Leibniz, Kant, Hegel, Singer, and the idea of Merleau-Ponty. 'N heads are better than one' constitutes the philosophical hypothesis of the Delphi method. The Delphi method is a way to construct effective interaction and communication among participating individuals, allowing a group of people to have the opportunity to work together on complex problems through structured programming. Delphi is a group communication process that requires expert groups to remain anonymous throughout their participation and to systematically gather expert opinions through repeated rounds of feedback questionnaires (Linstone and Turoff, 2011). After numerous Delphi rounds, experts may develop a consensus or other valuable conclusions through interaction. The experts involved in the Delphi process are selected from experts of different fields with different life experiences and professional strengths. During the Delphi process, each expert will express their own opinions and comments on the topics covered in the entire agenda, and they will also interact with others, being able to comment on the views of others. Therefore, the Delphi method should be suitable for constructing organizational concerns for the JD-R competency model.

2.6. The policy Delphi method

The classical Delphi method is imperfect, and the Policy Delphi was introduced in this context (Seker, 2015). Turoff (1970) used the properties of a Hegelian Inquiry process (Linstone and Turoff, 2011) when designing the policy Delphi. Policy Delphi is committed to generating the most vigorous opposition to resolving policy issues (Linstone and Turoff, 2011; Seker, 2015). The policy Delphi process will generate two opposing groups with opposing views, and these two groups will debate the topics (Seker, 2015). The difference between policy Delphi and classical Delphi is that classical Delphi is more interested in reaching consensus, while policy Delphi focuses on debate. Turoff (1970) elaborated on Policy Delphi in his article "The Design of a Policy

Delphi", proposing that the best carrier for Policy Delphi is a computerized version. Online Delphi technology eliminates the traditional round structure and proceeds continuously and dynamically at each stage of the process (Linstone and Turoff, 2011). The computerized Delphi method can combine the advantages of the Delphi method and computer technology (Seker, 2015).

2.7. The Delphi method in current organizational contexts

As a perfect tool for the group communication process (Linstone and Turoff, 2011), the Delphi method has always played an important role in current organizational studies. Roblek et al. (2024) applied the Delphi method to explore the possibilities for implementing agility management concepts in Slovenian health-care organizations. Huang et al. (2022) developed indicators of age-friendliness for communities in Taiwan through a modified Delphi Method. Olsen et al. (2021) used the Delphi method to aid in group decision-making and build organizational consensus in pharmacy education. Slušná et al. (2024) explored the key factors of Industry 4.0 development from the perspective of R&D organizations using the Delphi method. Sawada et al. (2022) studied the perceived impact of nurse turnover on the organization using the Delphi method. The Delphi method has significant value in organizational problem research and achieving organizational consensus.

3. Research methodology

3.1. Research design

The current research will adopt a qualitative method research design, attempting to answer each question raised. Firstly, we use the Document analysis method to establish the framework of the JD-R competency model to answer the first question. Then, explore practical strategies for achieving organizational-level consensus through online traditional Delphi methods. Finally, the policy Delphi method is used to explore solutions when organizational consensus is not reached. The operational framework of the study is shown in Fig. 1.

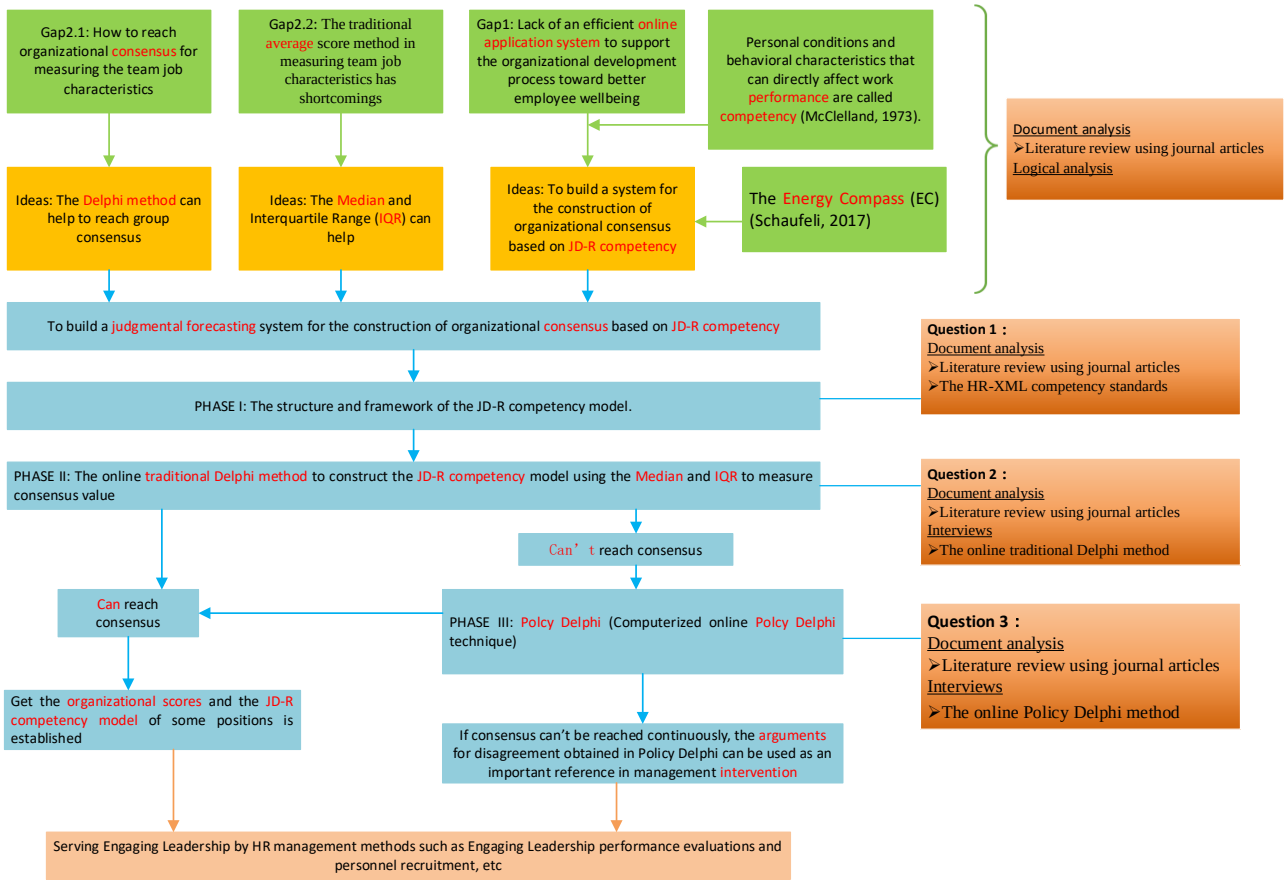

Fig. 1: The operational framework of the study

3.2. Phase 1: The structure and framework of the JD-R competency model

Research has shown that the primary issue in the methodology of the competency model's development and validation is to identify constructs of competency, which can be addressed through literature review and document analysis (Suhairom et al., 2014). The validity of the model's content can be further validated through consensus among expert groups. The issue of reliability was also discussed.

Some scholars define competency as personal characteristics that serve specific goals in a specific

environment, including knowledge, skills, attitudes, etc. (El Asame and Wakrim, 2018). The competency model established in this study is based on the JD-R model. The goal is to serve Engaging Leadership and benefit the occupational health of employees, which is this study's "specific goal". Establishing this competency model is based on a company or organization as a unit. Therefore, the organizational environment is known as the "specific environment". At the same time, the collection of elements such as knowledge, skills, and attributes constitutes the job characteristics of the JD-R model (Schaufeli, 2017). From the perspective of the definition of competency, it is feasible to establish a competency model based on the JD-R model.

Competency Modelling has three methods: the single-job approach, the "one-size-fits-all" approach, and the multiple-job approach (Chouhan and Srivastava, 2014). This study adopts the single-job approach developed for a single-job position and applies it to employees working in a specific position or managers executing Engaging Leadership. According to the JD-R theory (Bakker and Demerouti, 2017), each job position's characteristics are different. Therefore, the weights and other connotations of competencies based on the job characteristics for each job position are different. It is the reason why we adopt the single-job approach. The selection criteria for these job positions are for human resource management personnel to review whether the position requires the selection or development of better candidates (Chouhan and Srivastava, 2014).

The specific operation method of the single-job approach mainly consists of two steps (Chouhan and Srivastava, 2014).

i. The first step is to collect data through interviews, surveys, or observations.
ii. The second step is to analyze the data and form the competency model. This model includes all important competencies for the position, and each competency should have a definition and specific behavioral standards. These behavioral standards tell people what the personnel in the position need to do to achieve effective results.

This study adopted the above operational steps. Specifically, the first step is to use the online Delphi method to collect data. In the second step, we use techniques such as the quartile method to determine whether a consensus has been reached and finally form each competency element's ranking and interval values. The ranking value indicates the importance of the competencies required for the job. The interval value indicates information such as the qualification of each competence. For the definition of each competency, we refer to the job characteristics in Energy Compass (Schaufeli, 2017), which include job demands and resources. Sorting and interval values indicate the "behavioral standards" for each competency.

This JD-R competency model mainly refers to the principles in HR-XML competency standards (El Asame and Wakrim, 2018). The HR-XML competency standards are simple and flexible, with solid applicability. According to the HR-XML (El Asame and Wakrim, 2018), competency is a human resource's ability to achieve task objectives in a specific environment, including knowledge, skills, attitudes, etc. And it has four characteristics: specific, identifiable, definable, and measurable. The competency model of this study was established based on the application tool Energy Compass of the JD-R model (Schaufeli, 2017). The elements of job demands and job resources used in the competency model are all from the Energy Compass scale so that they can meet the four characteristics proposed by HR-XML. The competency model is based on the JD-R model, aiming to serve Engaging Leadership and promote employees' occupational health. It is the goal of this study. The establishment of this competency model is within a company or organization. Therefore, the organizational environment is the specific environment for establishing this competency model. At the same time, the collection of elements such as knowledge, skills, and attributes constitutes the job characteristics of the JD-R model. In summary, it is reasonable for us to establish a JD-R competency model based on the Energy Compass scale, which aligns with the principles of HR-XML competency standards.

HR-XML proposes several elements to define capability information. It claims it is essential to set competency weights and present proficiency level information. When discussing and improving HR-XML, some scholars also argue that it is necessary to specify the proficiency level (El Asame and Wakrim, 2018). Consequently, to be competent for the position, it is essential to explain the basic standards that the corresponding competencies need to meet. Therefore, in the JD-R competency model, we need to solve two fundamental problems: one is to sort the elements, and the other is the starting point of each element's competency interval. Considering the competency weight, we need to sort the elements. Considering the basic standards each competency needs to meet, we shall set the starting point of each element's competency interval. According to the conservation of resources theory, resources are limited. Therefore, the job resources that any organization can provide cannot be unlimited. Similarly, when dealing with various job demands, an individual's ability may be limited. Considering this, we innovatively set the vertex value in addition to the starting point of the competency interval range. The JD-R competency model is shown in Fig. 2.

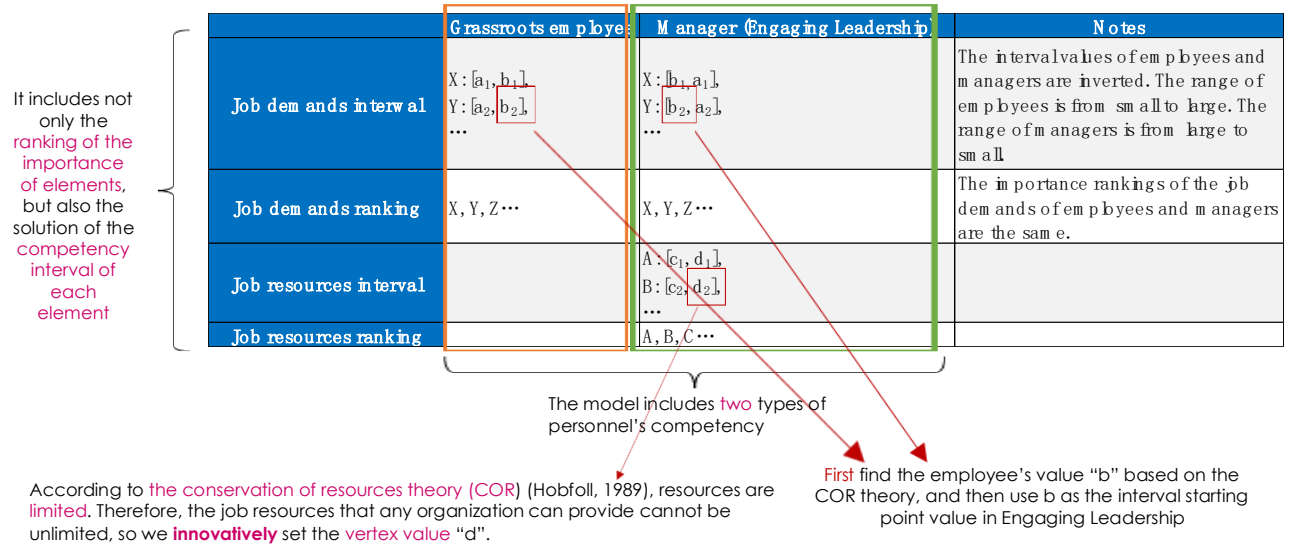

Fig. 2: The JD-R competency model

This competence model includes two applicable groups: Grassroots employees and managers.

A. The competence of the grassroots employee:

It mainly aims at employees' job demands to be competent for a specific position. It includes job demand ranking and job demand intervals. Based on considering competency weight in HR-XML competency standards (El Asame and Wakrim, 2018), we need to sort the importance of elements, namely job demand ranking. As shown in Fig. 3, the job demand intervals include the interval's starting point and vertex values. Considering the basic standards each competency needs to meet (El Asame and Wakrim, 2018), we shall set the starting point of each element's competency interval. The setting of interval vertices in job demand intervals is the innovation of this study. According to the conservation of resources theory, resources are limited. Job demands refer to aspects that require the consumption of psychological or physiological energy in work, which may bring exhaustion. Therefore, when dealing with various job demands, the resource consumption of psychological or physiological energy that an individual can bear in their work may be limited. Considering this, we innovatively set the vertex value as the maximum job demands value that employees can generally bear in a certain job position.

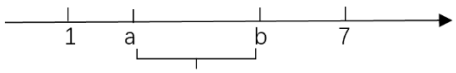

Fig. 3: The Job demands interval or job resources interval

B. The competency of the manager established for Engaging Leadership:

It applies to management personnel. According to the Engaging Leadership theory (Schaufeli, 2015), managers should strive to improve employees' job resources and reduce their job demands. Therefore, we first propose that engaging leaders' competency should include managers' competency in improving employees' job resources and reducing their job demands. And we innovatively propose that the interval values of the former should be from small to large, while the interval value of the latter should be from large to small.

a. The managers' competence in improving job resources. It consists of two dimensions: ranking and interval. Based on the competency weight in HR-XML competency standards (El Asame and Wakrim, 2018), we need to sort the importance of elements, which is the ranking dimension. According to the Engaging Leadership theory (Schaufeli, 2015), managers should strive to improve employees' job resources. Therefore, we innovatively propose that its interval value should be from small to large. As shown in Fig. 3, the intervals include the interval starting points and vertex values. Considering the basic standards each competency needs to meet (El Asame and Wakrim, 2018), we shall set the starting point of each element's competency interval. The setting of interval vertices is the innovation of this study. According to the conservation of resources theory, resources are limited. Job resources refer to the resources that are helpful in completing tasks on the job, which will reduce the burnout caused by job demands and promote employee well-being. Therefore, the job resources that any subject can provide cannot be unlimited. As a result, we innovatively set the vertex value for the manager's competency in Engaging Leadership, which is the maximum job resources value the manager can generally provide in a specific job position.
b. The managers' competence in reducing employees' job demands. It consists of two dimensions: ranking and interval. We need to set the ranking dimension based on the competency weight in HR-XML competency standards (El Asame and Wakrim, 2018). According to the Engaging

Leadership theory (Schaufeli, 2015), managers should strive to reduce employees' job demands. Therefore, we innovatively propose that its interval value should be from large to small. The intervals include the interval starting points and vertex values. We innovatively suggest that regarding "ranking", managers' competency in managing employee job demands is the same as the job demands competency in grassroots employees. In contrast, the "interval" values are the opposite. In terms of job demands, the interval values of employees and managers are inverted. The range of employees is from small to large, while the range of managers is the same value but from large to small.

Our arguments are well-founded. In the job demands competency of grassroots employees, we set the interval vertex value as the maximum value that employees can generally bear. Therefore, when it exceeds this value, employees will face harm. Therefore, when managers manage employees' job demands, the starting point should be the maximum value and cannot be larger. In the grassroots employees' competency, the interval's starting point is the minimum value employees generally need to be competent for the position. Therefore, if it falls below this value, the employee may not be competent for the job position. Therefore, when managers manage employees' job demands, the endpoint value should be this minimum value. It is easy to understand that the ranking of the two is the same: the critical job demands required to excel for employees in a specific position should naturally be the focus of management attention.

3.3. Phase 2: The online traditional Delphi method to construct the JD-R competency model using the Median and IQR to measure consensus value

Establishing this competency model is the problem we want to solve next. The JD-R model in this study mainly includes two aspects: interval and sorting. The determination of these contents is the process of determining the knowledge, skills, attitudes, personal attributes, etc., required in the JD-R model to be competent for a specific position, namely competency mapping (Chouhan and Srivastava, 2014). It should be emphasized that this JD-R competency model is different from ordinary competency models. It is established from the perspective of the JD-R model, aiming to serve employees' occupational health and Engaging Leadership. Through competency mapping, we will gain at least the following benefits (Chouhan and Srivastava, 2014): Competency mapping can help identify the critical competencies required to complete work tasks. Facilitate SWOT analysis for individual employees. It can help employees identify and analyze their strengths and weaknesses in specific positions, help them develop career training plans, and facilitate subsequent career development. Competency mapping can help reflect the level of employee competence for the position. It is the most accurate method to measure the individual competencies of employees in an organization. It also has excellent value for employee recruitment and selection. Competency mapping can help understand the needs of organizations for capabilities in the process of development and change. We can develop core competencies in organizational development and change through various methods such as training, recruitment, and selection. It is an important aspect of human resource management that can help human resource managers identify the most critical competencies for success in the work environment.

We used the Online Delphi technology in this study. The popularization of computer networks can significantly improve Delphi technology. Online Delphi technology eliminates the traditional round structure and instead proceeds in a continuous and dynamic form at each stage of the process (Linstone and Turoff, 2011). According to Linstone and Turoff (2011), Delphi's networking has led to the strong development of large collaborative groups. They called for integrating Delphi with the concept of "structural modelling" (Turoff, 1972). They insist on using it to expand Delphi's concept and establish collaborative group models for large groups. According to Linstone and Turoff (2011), structural modelling can help people subjectively estimate problems and establish a working model through computer technology, a type of personal cognitive model. They argue that, like online Delphi technology, this collaborative model-built Delphi process allows participants to input new information and change their perspectives anytime, anywhere. A significant advantage of this model is that it can achieve continuous dynamic development and update the model with changes in data. This study attempts to establish a collaborative group model based on the J-DR model for organizations. We try to dynamically execute the Delphi process through a computer network at the organizational level to establish a discussion board system, which is also a judgmental forecasting system and a "structural modelling" process.

According to Linstone and Turoff (2011), the traditional Delphi process requires the following stages.

- In the first stage, participants explore the topic, and each group member provides information on the research topic. This step offers evaluation options and information, which is a qualitative operation. We have known the evaluation options in the traditional Delphi process in this study, so this step does not require experts to complete it. However, this step is necessary in the Policy Delphi process to list the possible causes of disagreement.
- In the second stage, we collect personal information and investigate how the participating group views the topic. It is the first evaluation

round to evaluate the options listed in the previous stage.

- In the third stage, we deal with differences encountered among team members. Collect and organize the previous evaluation information for experts to make new evaluations. Repeat the above operation, collect the evaluation information of the prior round, and organize it for experts to conduct new evaluations until a stable state is reached after several rounds.
- In the fourth stage, we may reach a consensus or a stable state. If we can get a stable state after several rounds, stop. This stable state may be consensus or non-consensus. The basis for stopping is not consensus but whether a stable state has been reached.

To improve the flexibility of user participation in decision-making, online Delphi has changed the traditional organizational form of Delphi (Linstone and Turoff, 2011). Organizing the Delphi process through computer and network communication methods can achieve asynchronous group communication, allowing participants to participate in the entire process at any convenient time and place (Linstone and Turoff, 2011). Therefore, as shown in Table 1, based on the computer network communication platform, we integrated several stages into a continuous and constantly changing process in online Delphi. This study uses competency models and their applications to help employees reduce job demands and improve job resources, ultimately serving the Engage Leadership. Corresponding to the first stage mentioned above, the options we need to evaluate are job demands and job resources extracted from the energy compass (Schaufeli, 2017). The specific content is shown in Table 2.

Table 1: The traditional Delphi and online Delphi

The traditional Delphi	Online Delphi: the traditional Delphi on the web
Stage 1: Provide evaluation options and information	We can directly obtain evaluation elements from the EC scale (Schaufeli, 2017)
Stage 2: Collect group evaluations Stage 3: Dealing with Disagreements	Continuous online platform interaction process
Stage 4: Achieving a stable state	Achieving a stable state

Table 2: The job demands and job resources extracted from the energy compass (Schaufeli, 2017)

Job demands	Qualitative job demands	Emotional demands
		Mental demands
		Physical demands
		Work-home conflict
	Quantitative job demands	Work overload
		Work underload
		Pace of change
		Negative change
	Organizational demands	Bureaucracy
		Harassment
		Role conflicts
Job resources	Social resources	Interpersonal conflicts
		Co-worker support
		Supervisor support
		Team atmosphere
		Team effectiveness
	Work resources	Role clarity
		Fulfillment of expectations
		Recognition
		Job control
		Person-job fit
		Task variety
		Participation in decision-making
		Use of skills
	Organizational resources	Availability of tools
		Communication
		Alignment
		Trust in Leadership
		Organizational justice
		Fair pay
		Value congruence
	Developmental resources	Performance feedback
		Possibilities for learning and development
		Career perspective

An important guarantee for the success of the Delphi method is the mastery of the knowledge of the participating members on the research topic (Fish and Busby, 1996). Inspired by the decision participants in the Delphi method theory (Turoff and Hiltz, 2009), and the systems analysis approach (Linstone and Turoff, 2011), this study proposes that there should be at least three populations involved, which include experts representing technical perspectives, management personnel representing institutional perspectives, and grassroots employees representing individual perspectives.

A. Delphi questionnaire.

We used Likert's method to organize voting. The competency model mainly applies to two types of people: grassroots employees and managers with the

mission of Engaging Leadership. The competence of employees only involves job demands. According to the Engaging Leadership theory (Schaufeli, 2015), engaging leaders have an obligation to reduce employee job demands and improve job resources. Therefore, the competence of managers involves both job demands and job resources. They all involve issues of interval and sorting. The interval refers to the minimum qualification requirements and the highest expected level that can be achieved for the position. As shown in Fig. 2, we can obtain all the information after solving the following issues. Specifically, we need to complete three tasks for the intervals: the starting points of the employee's job demands competency intervals, such as a_1; the vertices of the employee's job demand competency intervals, such as b_1; and the starting points and vertices of the management personnel's job resources competency intervals such as c_1 and d_1. Specifically, in terms of sorting, we need to complete the following tasks: sorting the job demands competencies of employees such as X, Y, Z, etc., which is also the ranking of the importance of competencies for managers to manage employees' job demands; Ranking of job resources competencies provided by management personnel such as A, B, C, etc. The seven levels for questionnaires applied to intervals are shown in Table 3.

Table 3: The seven levels for questionnaires applied to intervals

Lowest level	Lower level	Slightly lower level	Intermediate level	Slightly higher level	Higher level	Highest level
1 point	2 points	3 points	4 points	5 points	6 points	7 points

Examples of questionnaires applied to intervals:

- In terms of the job demand X, where do you think the minimum job demand value a_1, which is the basic standard for the employees to meet in this job position, should be in the seven levels? Please rate.
- Regarding job demand X, where do you think the maximum job demand value b_1 that employees can generally bear in this job position should be in the seven levels? Please rate.
- Regarding job resource A, where should the minimum expected value c1 for the competence of managers executing Engaging Leadership to provide that resource be in the seven levels? Please rate.
- Regarding job resource A, where should the maximum expected value d1 for the competence of managers executing Engaging Leadership to provide that resource be in the seven levels? Please rate.

The seven levels of questionnaires applied to sorting are shown in Table 4. Examples of questionnaires applied to sorting:

- We are trying to determine the importance of job demands that help employees perform the position. Which of the seven levels should the importance of the job demand X fall into? Please rate.
- We are trying to determine which of the numerous job resources in this position is more important. Which of the seven levels should the importance of job resource A fall into? Please rate.

Table 4: The seven levels of questionnaires applied to sorting

Very unimportant	Relatively unimportant	Slightly unimportant	Intermediate level	Slightly important	Relatively important	Very important
1 point	2 points	3 points	4 points	5 points	6 points	7 points

B. Operation panel

a. It mainly displays two types of content: the rating and comment bar. It can display the current question's statistical score after clicking on each question in the above questionnaire. Display the comment bar below the rating bar.
b. The rating bar displays the following content. We can see the statistical score of the current question, which may be the interval value score of a specific element or the ranking score of the importance of a certain element. We can see the current consensus state, which shows whether a consensus has been reached. My rating. The entrance for re-scoring.
c. The comment bar displays comments on the current issue. Each comment is followed by a cumulative rating of 'agree, neutral, and disagree', available for participant review at any time. The statistical method adds 1 point if the comment point is "agree", -1 point if it is "disagree", and zero points if it is "neutral". We can also rank all comments in order of cumulative score from high to low. The following points should be noted regarding the way participants interact and comment:

- Turoff (1970) emphasized that it is difficult to collect core and valuable information from many textual materials in Delphi. Therefore, Delphi's design should filter out the essence from superfluous things (Turoff, 1970). It is necessary to make the following two restrictions when participants express their comments and opinions: one is to limit the number of words in the comments, striving to be concise and avoiding lengthy arguments; the other is to limit the number of viewpoints in comments, where participants are free to express their opinions, but each comment can only represent one viewpoint. Because of using online Delphi technology, the word limit for comments will be easily set during

computer programming. At the same time, we can provide a prompt on the participant editing comment interface. That is, a comment can only contain one viewpoint. And we need to set up an administrator to patrol whether each comment can only represent one viewpoint. For unqualified items, the administrator can cancel the callback and prompt participants to edit again.

- Fish and Busby (1996) argued that to ensure the Delphi process's validity, it is necessary to strictly define the topics discussed, as participants often break restrictions on freedom of speech when expressing their opinions. Fish and Osborn (1992) also confirmed this point. Therefore, to address the above issues, we will add the administrator role in designing online Delphi, which is equivalent to the role of general coordinator in traditional Delphi processes. When experts' discussions exceed the scope of the topic, the administrator will handle their comments and viewpoints. The handling methods are diverse, including reminding experts by leaving comments below their comments or granting administrators specific permissions to delete comments beyond the scope of the topic.
- Intervention during the voting process: promoting consensus by "eliminating falsehood and preserving truth". Siraj et al. (2012) proposed the purpose of Delphi's third round of data collection to narrow the differences among experts and promote consensus on viewpoints. Siraj et al. (2012) used the following method: if the expert's score in the last round falls within the IQR, the answer in this round remains consistent with the last one; if the score in the last round is outside the IQR, it can be changed; if the score in the last round is outside the IQR and the previous viewpoint is still upheld in this round, a reason for adhering to this viewpoint needs to be provided. In the process of online Delphi, there is no staged multi-round process but rather a continuous process where participants can change their perspectives at any time (Linstone and Turoff, 2011). Inspired by Siraj et al. (2012), to promote interaction among participants and achieve a more effective consensus, we plan to include suggestive guidance information in the program. During the scoring process, the computer can identify experts whose scores fall outside the IQR at any time. At the same time as the expert provides his answer, he will be immediately reminded in the form of a prompt message. The reminder is: because your answer is outside of the IQR, please carefully consider your rating and highlight the basis for your rating in the comments section. This way, we can focus on experts with non-consensus views, allowing their opinions to receive full attention and careful consideration. Their views represent non-consensus components within the organization, and this operation intends to repeatedly demonstrate this focus through the Delphi process and "indirectly" promote consensus building (Siraj et al., 2012).

Moreover, conducting multiple rounds of repeated argumentation on issues through the Delphi method is usually a process of "eliminating falsehood and preserving truth" through collective wisdom. It comes from the reason the Delphi method is based on the idea that "reaching consensus through collective human intellectual processes is possible and often quite valuable." This study has two meanings or values related to " eliminating falsehood and preserving truth". One is to eliminate falsehood, which means negating the unreasonable views of experts who represent non-consensus, forcing them to abandon their original stance and return to the IQR range, which is conducive to reaching consensus. The other is preserving truth, which confirms the reasonable viewpoints among experts who represent non-consensus after repeated discussions. The views in this regard can genuinely represent the non-consensus of the organization, and these verified viewpoints are also of more reference value for further management or research. They may also become important reference materials and arguments for Policy Delphi. And we can see at least two benefits. On the one hand, because of "eliminating falsehood", it will be conducive to deepening organizational consensus. On the other hand, even if the viewpoints ultimately fall into a non-consensus area, it is valuable and referential because of the " preserving truth". At the same time, the above process is carried out through online anonymity. It also retains the advantage of the Delphi method compared to traditional methods of gathering group viewpoints, avoiding the pressure of the selection process caused by group consistency.

i. Record the fluctuation of voting scores at different times. People can freely set the time interval for recording, such as in quarters or months. There are two functions. One is to help observe whether the entire system is in a "stable" state to facilitate emergency management based on employee occupational health. Another aspect is that the time series records may have a reference value for enhancing and improving Engaging Leadership, such as the related applications based on Markov chains (Gagniuc, 2017) theory.

C. Judgment methods for reaching consensus

After summarizing the information from experts, scientific methods need to be used to analyze the data. As shown in Fig. 4, we used the median and interquartile range (IQR) in the central tendency measurement for statistical analysis. Regarding the measurement of relevant elements in the JD-R model at the organizational level, previous researchers preferred to achieve this by aggregating average scores at the individual level (Bakker and Demerouti, 2017). However, Bakker and Demerouti (2017) raised questions about the measurement of job demands and resources at the organizational level, stating that it is not appropriate to use a simple average score to represent the levels of the entire

team, as this may not avoid the impact of extreme scores within the group. The innovation of this study lies in the discovery that the median and interquartile range commonly used in the Delphi method are excellent methods to solve the above problems. The median can be used to investigate group opinions and is considered the most accurate statistical method for characterizing group opinions. The median, also known as the 50th percentile, expresses the concentration trend of the group's views on specific issues (Stone and Busby, 2005). It has the following characteristics: for a normal distribution, the median divides the distribution evenly into symmetrical and equal parts; if the distribution tilts towards one end, the median often approaches the highest or lowest score, which is common in many Delphi processes (Stone and Busby, 2005). IQR is the absolute value of the difference between the 75th and 25th percentiles, which is a good response to the data variability and avoids extreme data impact (Stone and Busby, 2005). It can be used to determine the degree of consensus among members of an organization on a certain issue, and a smaller value indicates a higher level of consensus (Stone and Busby, 2005). IQR is a powerful tool for investigating the relationships between each expert or project and is recognized as the most accurate statistical method in this regard (Siraj et al., 2012). This study used the Median and Interquartile Range to analyze data. It means identifying the relationships between projects through IQR, which can measure the organization's consensus level. We also investigated the opinions of most experts through the media (Siraj et al., 2012).

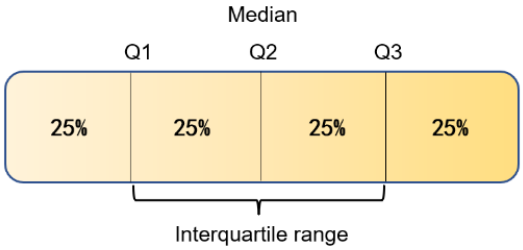

Fig. 4: The Interquartile range

We use the following formula to calculate the 25th, 50th, and 75th percentiles:

$$25\text{th percentile} = \text{Li} + \frac{(n/4 - \text{CumF})\text{Wi}}{\text{Fi}} \text{ or the minimum score} \quad (1)$$

$$\text{The median} = 50\text{th percentile} = \text{Li} + \frac{(n/2 - \text{CumF})\text{Wi}}{\text{Fi}} \quad (2)$$

$$75\text{th percentile} = \text{Li} + \frac{(3n/4 - \text{CumF})\text{Wi}}{\text{Fi}} \text{ or the maximum score} \quad (3)$$

where, Li is the lower real limit of the interval containing the desired percentile. N is the number of cases; CumF is the accumulated sum of the frequencies of all intervals preceding the interval containing the desired percentile; Fi is the frequency of the interval containing the desired percentile. Wi is the width of the interval containing the desired percentile.

Siraj et al. (2012) used Likert's 4-point scale in the study and utilized IQR to assess the level of consensus among participants. They divided the degree of consensus into three judgment intervals based on the IQR value: high consensus for IQR 0-1, moderate consensus for IQR 1.01-1.99, and no consensus for IQR ≥ 2.0 (Siraj et al., 2012). Stone and Busby (2005) used Likert's 7-point scale in the study and used an IQR value of 1.5 as the cutoff point for determining whether consensus was reached. This study used Likert's 7-point scale. Inspired by the study of Siraj et al. (2012) and Stone and Busby (2005), this study proposes to divide the degree of consensus into three judgment intervals: high consensus for IQR 0-1, moderate consensus for IQR 1.01-1.99, and no consensus for IQR ≥ 2.0.

Calculation of interval values for individual elements: the medians, after reaching consensus, will be used as the target values for the starting or ending points of each interval. Calculation of the ranking of the importance of elements: the median, after reaching a consensus, will be used as the final target value for scoring the importance of some element; then, sort all elements based on the target values. The endpoint of the Delphi process should be based on achieving a stable state, which may be consensus or disagreement (Linstone and Turoff, 2011).

The time for experts to reach a stable state. The traditional Delphi technology process generally has three rounds of interaction, and there are several reasons for this: firstly, it has been proven that it is sufficient to reach a stable state in general after three rounds; secondly, as the number of rounds increases, the output of valuable information will gradually decrease; thirdly, further operations after more than three rounds often bring little profit; fourthly, if there are too many rounds, participants will become impatient and find it difficult to accept psychologically (Fish and Busby, 1996; Linstone and Turoff, 2011). Therefore, when implementing online Delphi, the time it takes for experts to reach a stable state should not be too long.

3.4. Phase 3: The Computerized Online Policy Delphi method to deal with non-consensus situations in the JD-R competency model building process

According to Turoff (1970), the operational process of Policy Delphi includes the following steps:

Step 1. Propose the problem you want to solve
Step 2. Propose policy options for problem-solving
Step 3. Participants determine their initial stance on numerous policy options: which are agreed, which are not agreed, and which are not important and should be discarded.
Step 4. Explore the reasons for differences. What are the reasons, facts, or assumptions each person adheres to in their respective positions?
Step 5. The group evaluates the reasons for differences.

Step 6. Reevaluate your stance on policy options. Repeat the above rounds. In a paper-and-pencil Delphi procedure, five rounds need to be repeated in principle. However, certain methods can also be used in practice to maintain the above limits of three to four rounds.

This study identified a "non-consensus" state in the early stages through the traditional Delphi method. Clarifying the "non-consensus" state corresponds to the third step in the above process. Therefore, we do not need the first three steps mentioned above.

The difference from the operation process of Policy Delphi introduced by Turoff (1970) was that this study did not use the "paper and pencil Delphi procedure" but rather an online Delphi. Turoff (1970) believed that the best carrier for Policy Delphi is a computerized version, and online Delphi technology eliminates the traditional round structure and instead proceeds in a continuous and dynamic form at each stage of the process. This study continuously carried out the above operational process using the online Delphi format. The sequence of the above steps will be disrupted, and participants can participate in any step of the process at any time. They can express their opinions, change their views, and vote anytime.

We gave much attention to Step 4 of the above process. It is about exploring the reasons or arguments for differences. In this step, we form an online forum where participants freely express the basis and reasons supporting their respective positions; participants need to compare their opinions with the median values of group evaluations and express arguments on why their ratings are higher or lower. Scholars used the properties of a Hegelian Inquiry process defined by Linstone and Turoff (2011) when designing Policy Delphi, which shows that the philosophical foundation of Policy Delphi is Hegelian ideas. Moreover, Wijnhoven et al. (2010) proposed "The Hegelian Inquiry System and Critical Triangulation Tools for the Internet Information Slave." Therefore, this study uses online forums, combines Hegel's ideas in the Policy Delphi and the triangulation tools (Wijnhoven et al., 2010), and innovatively proposes the following methods. Each participant can label their comments, indicating that they belong to one of the four dimensions of the triangulation tools (Wijnhoven et al., 2010), and all arguments can be classified and displayed based on labels. This way, we can investigate the reasons for differences from the following four dimensions (Wijnhoven et al., 2010):

1. Data: Review of information sources. What data did you draw this conclusion from? We need to examine the reasons for the differences from the perspective of Data.
2. Investigator: It involves the identity background of participants, who are diverse and may include grassroots employees, theorists, managers, etc. We need to examine the reasons for the differences from the perspective of the identity and background of the Investigator.
3. Theory: Based on what theoretical viewpoint was this conclusion drawn? Of course, this may include J-DR theory, etc. Analyze the reasons for the differences from a theoretical perspective.
4. Methodology: Is there a problem with the methodology? Is there any bias? Analyze the reasons for differences from the perspective of methodology.

The group needs to evaluate the reasons or arguments for differences in Step 5. We can evaluate arguments through a free and open online forum. Participants can freely discuss and evaluate each argument entry, and they can also rate each argument. Each argument has an option of "agree, neutral, disagree", with +1 for agree, -1 for disagree, and zero for neutral. Arguments can be sorted and displayed based on cumulative scores.

There are similarities with the traditional Delphi method mentioned earlier in the article. It is necessary to give some restrictions on how participants interact and comment on the above two steps. Divided into the following two points:

1. Limit the number of words in the comment. A prompt can be provided on the interface where participants edit comments, meaning a comment can only contain one viewpoint. We also need to set up an administrator to patrol whether each comment can represent only one viewpoint. For unqualified comments, they can be deleted by the administrator.
2. We will add the role of administrator, which is equivalent to the general coordinator in traditional Delphi processes. When experts' discussions exceed the scope of the topic, the administrator will handle their comments. The processing methods can be diverse, including reminding participants by leaving comments below their comments or granting administrators the authority to delete comments.

The group shall re-evaluate the stances on policy options in Step 6. Participants can re-rate the issue, and a consensus evaluation can be conducted anytime. We can obtain a consensus-based conclusion if consensus can be reached. If consensus cannot be reached, repeat the above round.

The end of the Policy Delphi process is based on the achievement of a stable state. If consensus cannot be reached continuously, the evaluation of options in Step 6 above will be stopped if a stable state is reached. Linstone and Turoff (2011) mentioned that the Delphi process is proven to be sufficient to achieve a "stable state" after three rounds in general. Furthermore, Turoff (1970) argued that Policy Delphi does not necessarily end with reaching consensus or resolving differences. When a consensus is finally reached, it can be very useful to those sponsoring the study (Turoff, 1970).

When consensus cannot be reached in the end, it can serve as an analytical tool for policymaking and has an educational function (Turoff, 1970). Therefore, this study proposes that after reassessing the options in Policy Delphi, if consensus can be reached, it will enter the "consensus reached" state and form the result, and if consensus cannot be reached continuously, it will stop after reaching a stable non-consensus state. We can take the highest-scoring arguments from Policy Delphi as an important basis and reference for managing intervention processes. The purpose of management intervention is to serve the Engaging Leadership by reducing job demands and improving job resources. At the same time, according to the educational function of Delphi proposed by Turoff (1970), implementing the Delphi process will also have significant positive implications for improving Engaging Leadership. We can use educational functions to reduce ideological resistance to policy implementation among employees and strengthen the connection between grassroots employees and management personnel. Compared to traditional methods of gathering group perspectives, the Delphi method has the advantage that organized feedback can avoid ineffective communication and bias.

3.5. Reliability and validity in the Delphi questionnaire

Traditional reliability and validity are not appropriate in Delphi because they are difficult to calculate accurately and are not applicable to Delphi (Fish and Busby, 1996). Therefore, to solve the reliability and validity problems, we need to analyze the specific issues and find better solutions.

According to Fish and Busby (1996), due to the flexible and variable nature of the questionnaire in the Delphi method, it is not meaningful for us to conduct traditional reliability estimation. Fish and Busby (1996) proposed that calculating the participants' consensus rate could solve the Delphi approach's reliability problem. When participants develop a reasonable level of consensus, the reliability of the Delphi questionnaire is relatively good (Fish and Busby, 1996). On the one hand, we can calculate the consensus rate of participants towards specific issues through IQR in this study. On the other hand, we can obtain the consensus rate of participants at any time through continuous online interaction with Delphi. Therefore, the reliability of the Delphi questionnaire in this study can be examined through the implementation process. We found through the practical operation that a high consensus rate was reached multiple times among the participants, indicating that the reliability of the Delphi questionnaire in this study is relatively high.

The validity of the Delphi process depends on two factors: the selection of suitable participants appropriate for the field of investigation and the strict definition of the topic to be discussed (Fish and Busby, 1996). To solve the first problem, we have made stringent regulations on selecting participants for Delphi. The traditional system analysis method focuses on the technical perspective, and engineers and scientists represented by this perspective tend to be overly optimistic in the short term and pessimistic in the long term in the system analysis process (Linstone and Turoff, 2011). This study reached consensus through the perspectives of the technical, institutional, and individual perspectives, which addressed the bias of a single perspective (Linstone and Turoff, 2011). Fish and Busby (1996) argued that a strict definition of the topic under discussion is a good idea, but sometimes, it is not satisfactory when executed because participants often break restrictions on freedom of speech while expressing their opinions. Fish and Osborn (1992) also proved this in their research. Therefore, to address the above issues, we will add the administrator role when designing online Delphi, which is equivalent to the general coordinator role in traditional Delphi processes. When experts' discussions exceed the scope of the topic, the administrator will handle their comments. The handling methods are diverse, including reminding experts by leaving comments below their comments or granting administrators specific permissions to delete comment entries.

4. Experiments on building the JD-R competency model

This sector is about the experiments on building the JD-R competency model. The JD-R Competency model construction experiment will be introduced in the first part, aiming to validate the methods proposed. Then, it presents the experiment on the system's contribution to Engaging Leadership. This study raises a hypothesis and tries to verify it through quantitative data.

4.1. JD-R competency model construction experiment

An enterprise in China will serve as the system's initial test subject. Located in China's Shandong Province, PY Education Co., Ltd. specializes in educational technologies. With more than 200 workers, including more than 100 instructors, the company primarily operates in the education and education service sector. Workers were experiencing severe burnout because of their heavy workloads, high levels of psychological stress, and the intensity of competitiveness in the business. Job crafting and other intervention methods had never been considered by the company. We tested 100 volunteers. Two equal groups of 50 participants were formed: the experimental group and the control group. Full-time contracts covered all participants. The experimental group included 25 males and 25 females, with an average age of 38.5 years (SD=9.3), 39 bachelor's degrees, and 11 master's degrees. Nine experimental group members are managers, while the others are teachers. Teacher duties include teaching and training. The nine

experimental group managers have undergraduate degrees and handle the teachers directly. Their average age is 38.3 years (SD=3.5). In the control group, 25 males and 25 females averaged 37.6 (SD=9.1). Ten master's and 40 bachelor's degrees were awarded. The control group had nine managers with the same job positions and working environment as the experimental group. The remaining control group members are teachers who work in the same environment as the experimental group. The control group managers had undergraduate degrees and an average age of 38 years (SD=3.3). They managed the control group teachers directly. Participants were reminded that participation was voluntary. Participants understood and accepted the risks and advantages. All participants are anonymous.

The experimental group is the system's application object, while the control group receives no intervention measures. Control groups can be used to evaluate the effects of the experimental procedure on Engaging Leadership. Through online Delphi technology, the experimental group discussed and built the teacher's JD-R competency model. A consensus was ultimately achieved on multiple facets of the competency model following extensive conversation and interaction. Prior to that, participants engaged in discourse over the enduring non-consensus content utilizing the Policy Delphi technique and developed intervening recommendations for enhancement based on the arguments presented. Table 5 shows grassroots employees' consensus values of job demands competency intervals. Table 6 shows the consensus values of job demands competency ranking for the grassroots employees. Table 7 shows the Engaging Leadership managers' consensus values of job resources competency intervals. Table 8 shows the Engaging Leadership managers' consensus values of job resources competency ranking, and Table 9 shows the final data of the competency model.

Table 5: Consensus values of job demand competency intervals for grassroots employees

The consensus values of job demand competency intervals for the grassroots employee (the consensus values of job demand competency intervals for managers with engaging leadership are the same)

Job demands	IQR value of the starting point	Consensus level	IQR value of the endpoint	Consensus level
Emotional demands	0.66	High consensus	0.71	High consensus
Mental demands	0.84	High consensus	0.57	High consensus
Physical demands	0.68	High consensus	0.52	High consensus
Work-home conflict	0.74	High consensus	0.78	High consensus
Work overload	0.69	High consensus	0.94	High consensus
Work underload	0.77	High consensus	0.58	High consensus
Pace of change	0.93	High consensus	0.63	High consensus
Negative change	0.68	High consensus	0.72	High consensus
Bureaucracy	0.56	High consensus	0.57	High consensus
Harassment	0.82	High consensus	0.63	High consensus
Role conflicts	0.64	High consensus	0.69	High consensus
Interpersonal conflicts	0.87	High consensus	0.74	High consensus

Table 6: Consensus values of job demand competency ranking for grassroots employees

The consensus values of job demand competency ranking for the grassroots employee (The consensus values of job demand competency ranking for managers with Engaging Leadership are the same)

Job demands	IQR value	Consensus level
Emotional demands	0.78	High consensus
Mental demands	0.61	High consensus
Physical demands	0.53	High consensus
Work-home conflict	0.58	High consensus
Work overload	0.79	High consensus
Work underload	0.62	High consensus
Pace of change	0.54	High consensus
Negative change	0.88	High consensus
Bureaucracy	0.71	High consensus
Harassment	0.62	High consensus
Role conflicts	0.84	High consensus
Interpersonal conflicts	0.69	High consensus

4.2. The experiment on the system's contribution to engaging leadership

The Engaging Leadership hypothesis posits that leaders who prioritize inspiration, strengthening, and connection with employees can fulfill their fundamental psychological needs, consequently enhancing their engagement (Schaufeli, 2015). Delphi is a technique for developing a collective communication process (Linstone and Turoff, 2011). Consequently, the subsequent hypothesis is posited: The development of the JD-R competency model with the judgmental forecasting online support system will enhance the "connecting" aspect of Engaging Leadership. This study uses the PY Education Company as an experimental object and contains experimental and control groups. The Engaging Leadership situation was followed up with a questionnaire during the experiment. After ten equally spaced time points, a questionnaire survey was done every five days. We chose job crafting as the control variable to improve experimental rigor. Job crafting is a process whereby individuals autonomously assess and modify job demands and resources to enhance their work environment and well-being (Petrou et al., 2012; Tims and Bakker, 2010). Job crafting encompasses task crafting, relationship crafting, and cognitive crafting, and it

also promotes employees' active participation in molding job demands and resources (Bakker and Demerouti, 2017; Tims et al., 2012). Considering the above traits, job crafting will surely affect Engaging Leadership. PY Education Company has never implemented job crafting measures to intervene. To more effectively assess the impact of the method on Engaging Leadership, we refrained from implementing job crafting across all groups.

The Engaging Leadership Scale (Schaufeli, 2015) used in this study has a 0.87 Cronbach's alpha. This questionnaire focuses on dimensions of strengthening, connecting, empowering, and inspiring. The basic material of Engaging Leadership is four dimensions with three sub-items each, totaling 12 items that match the questionnaire's 12 questions. Following ten questionnaire surveys, this study gathered time and Engaging Leadership data as the experimental process developed. We investigated the relationship between time and Engaging Leadership data using Spearman correlation analysis, considering the discrete properties of the data. Table 10 shows the results for the experimental group, and Table 11 shows the results for the control group. It is evident that the control group does not exhibit a significant correlation between the Engaging Leadership data and time. The indicators of connecting and time exhibit a substantial positive correlation in the experimental group. We can infer that the process of developing this competency model is indeed advantageous for Engaging Leadership and has a positive impact on "connecting."

5. Conclusion and discussion

In summary, this paper describes the construction of the JD-R competency model and the organizational consensus from the perspective of Engaging Leadership. Among them, organizational consensus was achieved through the Delphi method, and we discussed situations where consensus was not reached through the policy Delphi method, which constitutes a judgmental forecasting system.

Table 7: Consensus values of job resources competency intervals for managers with Engaging Leadership

The consensus values of job resources competency intervals for managers with Engaging Leadership				
Job resources	IQR value of the starting point	Consensus level	IQR value of the endpoint	Consensus level
Co-worker support	0.68	High consensus	0.68	High consensus
Supervisor support	0.83	High consensus	0.84	High consensus
Team atmosphere	0.63	High consensus	0.59	High consensus
Team effectiveness	0.84	High consensus	0.88	High consensus
Role clarity	0.49	High consensus	0.92	High consensus
Fulfillment of expectations	0.52	High consensus	0.63	High consensus
Recognition	0.73	High consensus	0.64	High consensus
Job control	0.66	High consensus	0.37	High consensus
Person-job fit	0.79	High consensus	0.84	High consensus
Task variety	0.91	High consensus	0.72	High consensus
Participation in decision-making	0.68	High consensus	0.63	High consensus
Use of skills	0.73	High consensus	0.83	High consensus
Availability of tools	0.83	High consensus	0.91	High consensus
Communication	0.78	High consensus	0.83	High consensus
Alignment	0.79	High consensus	0.86	High consensus
Trust in leadership	0.81	High consensus	0.49	High consensus
Organizational justice	0.64	High consensus	0.68	High consensus
Fair pay	0.69	High consensus	0.72	High consensus
Value congruence	0.77	High consensus	0.81	High consensus
Performance feedback	0.52	High consensus	0.66	High consensus
Possibilities for learning and development	0.59	High consensus	0.89	High consensus
Career perspective	0.64	High consensus	0.92	High consensus

Table 8: Consensus values of job resources competency ranking for managers with Engaging Leadership

The consensus values of job resources competency ranking for managers with Engaging Leadership		
Job resources	IQR value	Consensus level
Co-worker support	0.71	High consensus
Supervisor support	0.82	High consensus
Team atmosphere	0.79	High consensus
Team effectiveness	0.88	High consensus
Role clarity	0.48	High consensus
Fulfillment of expectations	0.85	High consensus
Recognition	0.64	High consensus
Job control	0.58	High consensus
Person-job fit	0.75	High consensus
Task variety	0.91	High consensus
Participation in decision-making	0.82	High consensus
Use of skills	0.55	High consensus
Availability of tools	0.84	High consensus
Communication	0.76	High consensus
Alignment	0.53	High consensus
Trust in leadership	0.86	High consensus
Organizational justice	0.93	High consensus
Fair pay	0.61	High consensus
Value congruence	0.68	High consensus
Performance feedback	0.75	High consensus
Possibilities for learning and development	0.84	High consensus
Career perspective	0.69	High consensus

Table 9: Final data of the competency model

	Grassroots employee	Managers with Engaging Leadership
Job demands intervals	Emotional demands [4.16, 4.97], Mental demands [5.02, 5.77], Physical demands [3.55, 5.71], Work-home conflict [4.25, 5.58], Work overload [4.39, 4.96], Work underload [4.65, 5.48], Pace of change [4.41, 4.93], Negative change [3.71, 5.22], Bureaucracy [3.94, 4.82], Harassment [4.22, 5.38], Role conflicts [4.12, 4.93], Interpersonal conflicts [3.85, 4.38]	Emotional demands [3.96, 3.29], Mental demands [3.88, 3.26], Physical demands [5.23, 4.34], Work-home conflict [5.51, 4.83], Work overload [4.96, 3.83], Work underload [4.81, 4.36], Pace of change [4.68, 4.18], Negative change [5.37, 4.52], Bureaucracy [4.84, 3.57], Harassment [5.21, 4.65], Role conflicts [4.87, 4.11], Interpersonal conflicts [5.06, 3.47]
Job demands ranking	Work overload [M=5.76], Physical demands [M=5.71], Interpersonal conflicts [M=5.58], Bureaucracy [M=5.11], Mental demands [M=4.97], Emotional demands [M=4.67], Work-home conflict [M=4.53], Negative change [M=4.41], Role conflicts [M=4.28], Pace of change [M=4.04], Harassment [M=3.56], Work underload [M=3.29]	Work overload [M=5.83], Physical demands [M=5.72], Interpersonal conflicts [M=5.61], Bureaucracy [M=5.46], Mental demands [M=5.28], Emotional demands [M=5.11], Work-home conflict [M=4.96], Negative change [M=4.63], Role conflicts [M=4.33], Pace of change [M=4.21], Harassment [M=3.91], Work underload [M=3.42]
Job resource intervals		Co-worker support [3.55, 4.83], Supervisor support [3.98, 4.61], Team atmosphere [4.24, 5.32], Team effectiveness [4.76, 5.46], Role clarity [4.67, 4.99], Fulfillment of expectations [3.76, 3.93], Recognition [3.51, 4.87], Job control [4.03, 5.37], Person-job fit [3.95, 5.65], Task variety [3.57, 4.93], Participation in decision making [3.56, 4.85], Use of skills [4.21, 4.89], Availability of tools [3.98, 4.76], Communication [4.65, 5.38], Alignment [4.21, 5.78], Trust in leadership [4.55, 4.96], Organizational justice [3.65, 4.78], Fair pay [3.41, 3.79], Value congruence [3.66, 5.47], Performance feedback [4.38, 5.68], Possibilities for learning and development [3.56, 4.69], Career perspective [4.68, 5.17]
Job resources ranking		Fair pay [M=5.63], Performance feedback [M=5.51], Fulfillment of expectations [M=5.32], Alignment [M=5.17], Job control [M=4.85], Availability of tools [M=4.68], Role clarity [M=4.51], Participation in decision making [M=4.36], Supervisor support [M=4.24], Organizational justice [M=4.01], Possibilities for learning and development [M=3.79], Person-job fit [M=3.57], Use of skills [M=3.41], Career perspective [M=3.28], Team atmosphere [M=3.02], Communication [M=2.87], Co-worker support [M=2.67], Team effectiveness [M=2.52], Recognition [M=2.36], Task variety [M=2.20], Trust in leadership [M=2.03], Value congruence [M=1.69]

Table 10: Results of experimental group

Indicators	t
Inspiring 1: Connects with the mission and purpose of organization	R=0.096, P=0.011
Inspiring 2: Enthuses for plans and ideas	R=0.614, P<0.001
Inspiring 3: Emphasizes the meaning of the job	R=0.093, P=0.087
Strengthening 1: Delegates tasks and responsibilities	R=0.083, P=0.071
Strengthening 2: Encourages using talents and strengths	R=0.152, P=0.064
Strengthening3: Challenges	R=0.231, P=0.055
Connecting 1: Encourages collaboration	R=0.612, P<0.001
Connecting 2: Promotes team spirit	R=0.654, P<0.001
Connecting 3: Manages conflicts	R=0.691, P<0.001
Empowering 1: Recognizes ownership	R=0.173, P=0.001
Empowering 2: Stimulates freedom and responsibility	R=0.231, P=0.053
Empowering 3: Encourages voice	R=0.692, P<0.001

Table 11: Results of control group

Indicators	t
Inspiring 1: Connects with the mission and purpose of organization	R=0.031, P=0.021
Inspiring 2: Enthuses for plans and ideas	R=0.065, P=0.088
Inspiring 3: Emphasizes the meaning of the job	R=0.253, P=0.003
Strengthening 1: Delegates tasks and responsibilities	R=0.213, P=0.047
Strengthening 2: Encourages using talents and strengths	R=0.103, P=0.064
Strengthening 3: Challenges	R=0.085, P=0.032
Connecting 1: Encourages collaboration	R=0.211, P=0.004
Connecting 2: Promotes team spirit	R=-0.021, P=0.065
Connecting 3: Manages conflicts	R=0.324, P=0.024
Empowering 1: Recognizes ownership	R=0.138, P=0.011
Empowering 2: Stimulates freedom and responsibility	R=0.221, P=0.043
Empowering 3: Encourages voice	R=0.163, P=0.082

Establishing this system provides a feasible work plan for achieving consensus on measuring relevant attributes of job characteristics at the organizational level. We can predict the high value of the JD-R competency model in human resource management and organizational strategy, particularly in the application potential of Engaging Leadership and employee occupational health management.

The construction of competency models should be based on research while maintaining consistency with organizational culture and management strategies (Suhairom et al., 2014). The JD-R competency model in this study is based on a clear management strategy, which is academically research-oriented towards serving Engaging Leadership. Therefore, it particularly suits organizational culture dedicated to improving employee occupational health and well-being. For organizations that are committed to improving Engaged Leadership and prioritizing employee occupational health as part of their organizational culture, the construction system of this competency model is undoubtedly a good choice.

Compliance with ethical standards

Ethical considerations

This study involved human participants and was conducted in accordance with ethical standards. Participation was entirely voluntary, and informed consent was obtained from all participants. Anonymity and confidentiality were maintained throughout the study. No personally identifiable information was collected or stored. The study did not involve any physical or psychological harm.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Akkermans J, Brenninkmeijer V, Blonk RW, and Koppes LL (2009). Fresh and healthy? Well-being, health and performance of young employees with intermediate education. Career Development International, 14(7): 671-699. https://doi.org/10.1108/13620430911005717

Akkermans J, Brenninkmeijer V, Van Den Bossche SNP, Blonk RW, and Schaufeli WB (2013a). Young and going strong? A longitudinal study on occupational health among young employees of different educational levels. Career Development International, 18(4): 416-435. https://doi.org/10.1108/CDI-02-2013-0024

Akkermans J, Schaufeli W, Brenninkmeijer V, and Blonk R (2013b). The role of career competencies in the Job Demands—Resources model. Journal of Vocational Behavior, 83(3): 356-366. https://doi.org/10.1016/j.jvb.2013.06.011

Albrecht S, Breidahl E, and Marty A (2018). Organizational resources, organizational engagement climate, and employee engagement. Career Development International, 23(1): 67-85. https://doi.org/10.1108/CDI-04-2017-0064

Alldredge ME and Nilan KJ (2000). 3M's leadership competency model: An internally developed solution. Human resource management, 39(2-3): 133-145. https://doi.org/10.1002/1099-050X(200022/23)39:2/3<133::AID-HRM4>3.0.CO;2-8

Bakker AB and Demerouti E (2017). Job demands–resources theory: Taking stock and looking forward. Journal of Occupational Health Psychology, 22(3): 273-285. https://doi.org/10.1037/ocp0000056 **PMid:27732008**

Barenji RV, Hashemipour M, and Guerra-Zubiaga DA (2013). Developing a competency-assisted collaborative promotion modeling framework in higher education. Procedia-Social Behavioral Sciences, 107: 112-119. https://doi.org/10.1016/j.sbspro.2013.12.406

Chouhan VS and Srivastava S (2014). Understanding competencies and competency modeling—A literature survey. IOSR Journal of Business and Management, 16(1): 14-22. https://doi.org/10.9790/487X-16111422

El Asame M and Wakrim M (2018). Towards a competency model: A review of the literature and the competency standards. Education Information Technologies, 23: 225-236. https://doi.org/10.1007/s10639-017-9596-z

Fish LS and Busby DM (1996). The Delphi method. In: Sprenkle DH and Piercy FP (Eds.), Research methods in family therapy: 469, 482. 2nd Edition, The Guilford Press, New York, USA.

Fish LS and Osborn JL (1992). Therapists' views of family life: A Delphi study. Family Relations, 41(4): 409-416. https://doi.org/10.2307/585583

Gagniuc PA (2017). Markov chains: From theory to implementation and experimentation. John Wiley and Sons, New York, USA. https://doi.org/10.1002/9781119387596

Huang JY, Hsu HC, Hsiao YL, Chen FY, Lo SY, Chou TY, and Liu MF (2022). Developing indicators of age-friendliness in Taiwanese communities through a modified Delphi method. International Journal of Environmental Research Public Health, 19(21): 14430. https://doi.org/10.3390/ijerph192114430 **PMid:36361310 PMCid:PMC9658640**

Ilies R, Aw SS, and Pluut H (2015). Intraindividual models of employee well-being: What have we learned and where do we go from here? European Journal of Work Organizational Psychology, 24(6): 827-838. https://doi.org/10.1080/1359432X.2015.1071422

Linstone HA and Turoff M (2011). Delphi: A brief look backward and forward. Technological Forecasting Social Change, 78(9): 1712-1719. https://doi.org/10.1016/j.techfore.2010.09.011

Luo M and Lei J (2021). Using the JD-R model to predict the organizational outcomes of social workers in Guangzhou, China. Journal of the Society for Social Work Research, 12(2): 349-369. https://doi.org/10.1086/714311

Massa N, Santarpia FP, and Consiglio C (2023). Work characteristics as determinants of remote working acceptance: Integrating UTAUT and JD-R models. In: Kurosu M and Hashizume A (Eds.), International conference on human-computer interaction: 163-180. Springer Nature, Cham, Switzerland. https://doi.org/10.1007/978-3-031-35596-7_12

Olsen AA, Wolcott MD, Haines ST, Janke KK, and McLaughlin JE (2021). How to use the Delphi method to aid in decision making and build consensus in pharmacy education. Currents in Pharmacy Teaching Learning, 13(10): 1376-1385. https://doi.org/10.1016/j.cptl.2021.07.018 **PMid:34521535**

Petrou P, Demerouti E, Peeters MC, Schaufeli WB, and Hetland J (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. Journal of Organizational Behavior, 33(8): 1120-1141. https://doi.org/10.1002/job.1783

Rahmadani VG and Schaufeli WB (2019). Engaging leaders promote employees' well-being at work. In the Proceedings of the 5th International Conference on Public Health, 5(2): 1-7. https://doi.org/10.17501/23246735.2019.5201

Ramaci T, Santisi G, Curatolo K, and Barattucci M (2024). Perceived organizational support moderates the effect of job demands on outcomes: Testing the JD-R model in Italian oncology nurses. Palliative Supportive Care, 22(5): 1-9. https://doi.org/10.1017/S1478951524000890 **PMid:38766714**

Roblek V, Dimovski V, Jovanov Oblak K, Meško M, and Peterlin J (2024). Leadership and managerial challenges to ensure agile management as a method to enable business success: A Delphi study of the Slovenian health organisations. Measuring Business Excellence, 28(1): 39-51. https://doi.org/10.1108/MBE-09-2023-0122

Sampson D and Fytros D (2008). Competence models in technology-enhanced competence-based learning. In: Adelsberger HH, Kinshuk, Pawlowski JM, and Sampson DG (Eds.), Handbook on information technologies for education and training: 155-177. Springer, Berlin, Germany. https://doi.org/10.1007/978-3-540-74155-8_9

Sawada S, Takemura Y, Isobe T, Koyanagi H, and Kida R (2022). Perceived impact of nurse turnover on the organization: A Delphi study on managers of nursing. Journal of Nursing Management, 30(7): 3168-3177. https://doi.org/10.1111/jonm.13738 **PMid:35815682**

Schaufeli WB (2015). Engaging leadership in the job demands-resources model. Career Development International, 20(5): 446-463. https://doi.org/10.1108/CDI-02-2015-0025

Schaufeli WB (2017). Applying the job demands-resources model. Organizational Dynamics, 2(46): 120-132. https://doi.org/10.1016/j.orgdyn.2017.04.008

Segers J and Inceoglu I (2012). Exploring supportive and developmental career management through business strategies and coaching. Human Resource Management, 51(1): 99-120. https://doi.org/10.1002/hrm.20432

Seker SE (2015). Computerized argument Delphi technique. IEEE Access, 3: 368-380. https://doi.org/10.1109/ACCESS.2015.2424703

Shippmann JS, Ash RA, Batjtsta M, Carr L, Eyde LD, Hesketh B, Kehoe J, Pearlman K, Prien EP, and Sanchez JI (2000). The practice of competency modeling. Personnel Psychology, 53(3): 703-740. https://doi.org/10.1111/j.1744-6570.2000.tb00220.x

Simbula S (2010). Daily fluctuations in teachers' well-being: A diary study using the Job Demands–Resources model. Anxiety, Stress, and Coping, 23(5): 563-584. https://doi.org/10.1080/10615801003728273 **PMid:20352542**

Siraj S, Zakaria AR, Alias N, Dewitt D, Kannan P, and Ganapathy J (2012). Future projection on patriotism among school students using Delphi technique. Creative Education, 3(6): 1053-1059. https://doi.org/10.4236/ce.2012.326158

Slušná ĽK, Balog M, and Dokupilová D (2024). Identification of key factors of Industry 4.0 development from the perspective of R&D organisations using the Delphi method. International Journal of Management Enterprise Development, 23(2): 117-135. https://doi.org/10.1504/IJMED.2024.139271

Stone FL and Busby D (2005). The Delphi method. In: Sprenkle DH (Ed.), Research methods in family therapy: 238-253. Guilford Press, New York, USA.

Suhairom N, Musta'amal AH, Amin NFM, and Johari NKA (2014). The development of competency model and instrument for competency measurement: The research methods. Procedia-Social Behavioral Sciences, 152: 1300-1308. https://doi.org/10.1016/j.sbspro.2014.09.367

Taris TW, Kompier MA, Geurts SA, Schreurs PJ, Schaufeli WB, de Boer E, Sepmeijer KJ, and Watterz C (2003). Stress management interventions in the Dutch domiciliary care sector: Findings from 81 organizations. International Journal of Stress Management, 10(4): 297-325. https://doi.org/10.1037/1072-5245.10.4.297

Taris TW, Leisink PL, and Schaufeli WB (2017). Applying occupational health theories to educator stress: Contribution of the job demands-resources model. In: McIntyre T, McIntyre S, Francis D (Eds.), Educator stress: Aligning perspectives on health, safety and well-being: 237-259. Springer, Cham, Switzerland. https://doi.org/10.1007/978-3-319-53053-6_11

Tims M and Bakker AB (2010). Job crafting: Towards a new model of individual job redesign. SA Journal of Industrial Psychology, 36(2): 1-9. https://doi.org/10.4102/sajip.v36i2.841

Tims M, Bakker AB, and Derks D (2012). Development and validation of the job crafting scale. Journal of Vocational Behavior, 80(1): 173-186. https://doi.org/10.1016/j.jvb.2011.05.009

Tong R, Yang X, Li H, and Li J (2019). Dual process management of coal miners' unsafe behaviour in the Chinese context: Evidence from a meta-analysis and inspired by the JD-R model. Resources Policy, 62: 205-217. https://doi.org/10.1016/j.resourpol.2019.03.019

Turoff M (1970). The design of a policy Delphi. Technological Forecasting Social Change, 2(2): 149-171. https://doi.org/10.1016/0040-1625(70)90161-7

Turoff M (1972). Delphi and its potential impact on information systems. In the Proceedings of Fall Joint Computer Conference, ACM, Las Vegas, USA: 317-326. https://doi.org/10.1145/1479064.1479122

Turoff M and Hiltz SR (2009). The future of professional communities of practice. In: Weinhardt C, Luckner S, and Stößer J (Eds.), Designing e-business systems: Markets, services, and networks: 144–158. Volume 22, Springer, Berlin, Germany. https://doi.org/10.1007/978-3-642-01256-3_13

Vuori J, Toppinen-Tanner S, and Mutanen P (2012). Effects of resource-building group intervention on career management and mental health in work organizations: Randomized controlled field trial. Journal of Applied Psychology, 97(2): 273-286. https://doi.org/10.1037/a0025584 **PMid:21942405**

Wijnhoven F, Meertens L, and den Engelse N (2010). The Hegelian inquiring system and critical triangulation tools for the internet information slave. In the SIGHCI 2010 Proceedings. Available online at: https://aisel.aisnet.org/sighci2010/19/

Winterton J and Winterton R (2002). Developing managerial competence. Routledge, New York, USA. https://doi.org/10.4324/9780203020395