

Unveiling the gaze: deciphering key factors in selecting knowledge workers through eye-tracking analysis

Mahshid Pourhosein and Mehdi Sabokro
Yazd University, Yazd, Iran

European Journal
of Management
Studies

75

Received 3 November 2024
Revised 22 December 2024
Accepted 6 January 2025

Abstract

Purpose – The purpose of this study is to identify and analyze the characteristics and visual patterns of successful knowledge workers using quantitative methods, particularly eye-tracking technology. By conducting a systematic review and matching identified factors with theoretical literature, the research aims to uncover key attributes that contribute to the effectiveness of knowledge workers. These insights are intended to improve employee selection processes, ensuring the right candidates are chosen based on their cognitive, behavioral and visual traits.

Design/methodology/approach – A mixed-methods approach is employed in this study, consisting of three phases: (1) a systematic literature review identifies key characteristics of successful knowledge workers, (2) these factors are aligned with theoretical frameworks and expert insights to assess their applicability and (3) empirical data is collected through questionnaires and eye-tracking assessments involving ten high-performing site design employees and ten students from Shahid Beheshti University. SPSS software and Tobii Pro Lab tools are used for data analysis to establish correlations between eye movement patterns and attributes of effective knowledge workers.

Findings – The findings reveal that students whose eye movement patterns resemble those of high-performing knowledge workers also share similar cognitive and behavioral characteristics. Identified key attributes include enhanced problem-solving skills, adaptability and effective communication. The study further highlights the potential of eye-tracking technology as a valuable tool in employee selection, offering insights into visual behaviors that correlate with high performance in knowledge work. These findings provide a deeper understanding of the critical traits that optimize organizational performance.

Originality/value – This study presents a novel approach by integrating eye-tracking technology into the knowledge worker selection process. It provides empirical evidence of the visual and cognitive patterns associated with high performance, thereby enhancing the theoretical understanding of knowledge worker selection. The study contributes valuable insights for organizations aiming to refine their hiring practices, emphasizing the importance of both cognitive skills and visual behaviors in candidate assessment. This research lays the groundwork for future studies exploring the intersection of technology and human resource management to optimize workforce effectiveness.

Keywords Knowledge workers, Eye-tracking, Employee selection

Paper type Research paper

Introduction

In today's world, the main economic resources, capital, natural resources, etc., are no longer a competitive advantage, but a sustainable competitive advantage is the knowledge of employees. Experts believe that six factors are effective on the efficiency of any organization, which includes human, organizational, economic, political, institutional, and social factors, the most important of which are human factors (Nguyen *et al.*, 2020). Recent research highlights hybrid methodologies combining traditional human resource management (HRM) practices with AI and machine learning (ML) approaches, enabling organizations to optimize talent acquisition, management, and retention (Zhou and Cen, 2023). These hybrid systems not



© Mahshid Pourhosein and Mehdi Sabokro. Published in *European Journal of Management Studies*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence maybe seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

European Journal of Management
Studies
Vol. 30 No. 1, 2025
pp. 75-94
Emerald Publishing Limited
e-ISSN: 2635-2648
p-ISSN: 2183-4172
DOI 10.1108/EJMS-10-2024-0106

only enhance decision-making efficiency but also provide data-driven insights to reduce biases in recruitment processes.

In this regard, Werdhiastutie and *et al.* also states that human resources and knowledge are important assets of organizations to produce valuable resources and capabilities of organizations (Werdhiastutie *et al.*, 2020). On the other hand, the level of fluidity of employees depends on their ability, knowledge, maturity, skills, and experiences. In fact, according to the ability, flexibility, and possibility of using each employee's ability in different organizations and jobs, suitable working conditions are provided for them outside the organization. Therefore, organizations have a greater desire to attract elite employees, so the age of knowledge is called the "War for Elitism". Therefore, organizations compete to attract knowledgeable and fluid employees, and knowledgeable employees are looking for a more suitable and attractive work environment (Bartkowiak *et al.*, 2021).

Today, organizations use objective performance measurement methods such as psychological evaluations, behavioral interviews, personality evaluations, and job knowledge tests to select and match a person to a job. Selecting and hiring employees is one of the most important functions of the human resources management system. Today, only a few employers evaluate their recruitment process as positive and successful (Shet and Nair, 2023). Therefore, a fundamental revision in the recruitment and selection of human resources is inevitable (Girsang *et al.*, 2023). One of the reasons for the ineffectiveness of traditional methods in identifying the right people in the recruitment process is not paying attention to the data collected from the applicants and the hidden relationships between them. This problem has caused managers not to have enough information to judge and make decisions on the issue of selecting human resources, especially technical personnel (Akhavan Kharazian and Sharifi, 2018). A review of the research literature has shown that various criteria have been considered for the selection of employees.

For example, Poursaid and Ashuri (2013) consider professional, religious, political, family, and moral qualifications as criteria for selecting knowledge workers. Bourgault *et al.* (2006) introduced fundamental criteria for selecting knowledgeable employees, including political acumen, strategic skills, foresight and innovation, complexity management, adaptability and continuous learning, leadership, emotional intelligence, human resource management, knowledge management, utilization of ethical values, communication and negotiation, technical skills, acceptance of new governance, and performance management.

Vathanophas and Thai-ngam (2007), development and improvement of others, organizational awareness, orientation to progress (achievement), professional experience, self-improvement, team leadership and guidance, interpersonal understanding, cooperation and communication, organizational commitment, initiative action, flexibility, self-confidence, communication and influence (influence), computer knowledge and familiarity with information technology, willingness to serve, analytical thinking, honesty and integrity, attention to order, quality and accuracy, information seeking or Searching for information (curiosity), self-examination, fundamental thinking (conceptual or perceptual thinking) and familiarity with foreign languages (English) were listed as essential skills for selecting academic human resources.

In their research, Bassett-Jones (2023) listed the ability to provide quality services, teamwork, communication skills, learning ability, managerial and leadership skills, and supporting organizational values and goals as the characteristics of human resources for selection. In his research, Aggarwal (2013) introduced technical skills and knowledge, technology management skills and knowledge, business skills and knowledge, and managerial and interpersonal skills as criteria for selecting human resources.

While work processes in advanced technology industries have become diverse and complex, the need for high-quality employees in these organizations has grown increasingly (Blank, 2024). This means that the common approach of selecting and selecting employees based on the characteristics of static jobs is no longer sufficient; Therefore, the design of an integrated system for the selection and selection of employees is a way forward. Until today,

the recruitment tests of knowledge workers have been based on paper-and-pencil questions, which, in addition to measuring expertise, sought to understand personality types, motivational discussions, and overall psychological processes of job applicants. These tests usually use different models, but their main problem is the non-comprehensive criteria and effective factors in selecting knowledge workers. Based on the review of research bases, the factors affecting the selection of knowledge workers measured in the research are given in the Table 1.

One of the approaches used in behavioral science research, especially in industrial psychology and management, is how people process information. Because employees, especially knowledge employees, process information and make decisions in working environments and situations according to the nature of their work, understanding how knowledge workers process information may lead us to identify the characteristics of knowledge workers. To understand how information is processed, there are various tools in neuropsychology. One of these tools that has recently received attention is the eye movement tracking system. Understanding how visual and cognitively processed information is acquired is useful in many contexts (Wedel *et al.*, 2023). At first glance, the sense of sight may not attract special attention, but considering that eye movements are vital for the awareness of bottom-up perceptual features (objective to mental) from the external world and top-down cognitive processes (from mind to reality), the visual system, as one of the specialized organs in human perception and one of the five most important senses, has received more attention and trust in providing data (Kang *et al.*, 2022).

The integration of AI in HR practices is transforming traditional recruitment paradigms. AI effectively analyzes unstructured data, such as resumes and social media, to assess candidates' suitability, outperforming human evaluators in high-volume scenarios (Li *et al.*, 2023). Hybrid AI systems, blending NLP and psychometric testing, automate candidate evaluations with promising results (Nguyen *et al.*, 2022).

Organizations leverage AI-powered analytics to identify and develop talent, combining these tools with traditional methods like structured interviews and performance appraisals for a balanced evaluation of technical and soft skills (Smith *et al.*, 2023). This is especially critical in selecting knowledge workers, where creativity and adaptability are key.

In the competitive "War for Talent," advanced methodologies integrate data analytics with neurocognitive assessments. Wearables and biometric sensors assess candidates' stress responses, decision-making, and cognitive flexibility during simulated tasks (Choudhury

Table 1. Effective factors in the selection of knowledge workers

Row	General skill	Researchers who have worked in this field
1	Communication skills	Hassanzadeh <i>et al.</i> (2014), Farahmand (2020), Johari <i>et al.</i> (2022), Van Laar <i>et al.</i> (2020), Lewis-Gunn (2022), Ouedraogo <i>et al.</i> (2022), Zhang <i>et al.</i> (2024)
2	Problem-solving ability	Surawski (2019), Mwantu <i>et al.</i> (2021), Muzam (2023), Ala-Luopa <i>et al.</i> (2024)
3	Teamwork	Erhardt (2011), Chuang <i>et al.</i> (2016), Toth <i>et al.</i> (2021), Greene (2024), Lonsdale <i>et al.</i> (2024)
4	intelligence	Kubátová (2012), Aydogmus (2019), Manuti and Monachino (2020), Schemmer <i>et al.</i> (2021), Teoh Yi Zhe and Keikhosrokiani (2021)
5	Scientific ability	Heller (2007), Etkina <i>et al.</i> (2010), Hosseingholizadeh <i>et al.</i> (2016), Amar and Mullaney (2017), Veteläinen (2023)
6	Risk Taking	Man <i>et al.</i> (2017), Aulin <i>et al.</i> (2019), Low <i>et al.</i> (2019), Bhandari <i>et al.</i> (2021), Hock-Doepgen <i>et al.</i> (2021)
7	Management skills	Hendarman and Tjakraatmadja (2012), Cobo (2013), Semertzaki (2017), Hamdan Mansour <i>et al.</i> (2020), Saniuk <i>et al.</i> (2023)

Source(s): The authors

et al., 2024), enhancing accuracy and providing actionable insights. Traditional tools, such as psychological evaluations, remain essential, but hybrid systems, integrating AI and dynamic assessments like gamified tests, offer a more holistic view of candidates by evaluating adaptability and interpersonal skills under pressure (Li *et al.*, 2023).

AI also promotes diversity and inclusion by anonymizing candidate profiles and reducing biases. It helps organizations address disparities in hiring by analyzing demographic patterns (Nguyen *et al.*, 2022). Advanced AI tools assess intangible qualities like emotional intelligence through sentiment analysis and behavioral simulations (Choudhury *et al.*, 2024). Emerging technologies, such as eye-tracking combined with AI, analyze cognitive processes and decision-making in real time. These innovations are particularly useful for selecting knowledge workers, where efficient information processing is vital (Buettner *et al.*, 2018a, b).

In summary, integrating AI and hybrid methodologies represents a paradigm shift, enhancing recruitment accuracy and efficiency. This evolution enriches organizational psychology and sets the stage for future research in HR management.

New researchers have used tools such as EEG, Functional Magnetic Resonance Imaging (fMRI), and Transcranial Electrical Stimulation (TMS). However, one of the tools that has recently been welcomed by researchers is the eye movement tracking technique. In the eye-tracking method, inference measures are more accurate and reliable than self-reported measures (O'Connell and Walther, 2015). This method allows the researcher to objectively understand where and what subjects a person is looking at and for how long. In addition, it gives us information about the visualization pattern and the changes in the pupil size of the subjects when exposed to the stimuli. (Buettner *et al.*, 2018a, b).

Another point that justifies the necessity of the current research is that if the eye movement monitoring device can provide us with a pattern of the eye movements of knowledge workers and if this pattern can distinguish between knowledge workers and non-knowledge workers, then the managers of organizations, companies Instead of non-standard interviews, they can use such patterns to select knowledge workers. On the other hand, identifying effective factors in the selection of knowledge workers in this research and discovering a possible pattern between eye movements and the effective factors in the selection of knowledge workers, may provide managers with a more accurate selection tool. The present study, as pioneering research, can help researchers discover newer fields of human resources research and provide researchers with a novel perspective.

Method

An issue that attracts more and more people's attention is "Power Analysis", by which it is possible to determine the size of the sample required to conduct research. In other words, power analysis is a technique used to determine the number of repetitions of an experiment (sample size) using the confidence level and standard deviation (Ryan, 2013). To ensure the appropriate number of samples, the experiments were first conducted with five samples, and the results were then checked using G*Power software. Subsequently, the required sample size was estimated to be ten participants to obtain reliable data.

The data in this research were collected using an eye-tracking device and a questionnaire. The full description of these tools is provided below:

- (1) **Hepner's Problem-Solving Questionnaire (PSI):** The problem-solving questionnaire, developed by Hepner and Petersen (1982), contains 35 items to measure the respondent's understanding of their problem-solving behaviors, specifically how individuals react to their daily problems. The problem-solving questionnaire has been tested with multiple sample groups. It demonstrates **relatively high internal consistency** with alpha values ranging from 0.72 to 0.85 across the subscales (0.72 PC, 0.84 AA, 0.85 PSC), and 0.90 for the overall scale. The validity of the test indicates that it measures constructs related to personality variables,

particularly the locus of control. The total scale score for PSI ranges from 32 to 192. [Hepner and Petersen \(1982\)](#) proposed that PSI scores should not be interpreted as measures of actual problem-solving ability but rather as perceived problem-solving abilities. Higher scores indicate negative perceptions of one's problem-solving capability.

- (2) **Queen Dam Communication Skills Questionnaire (CSTR):** This communication skills questionnaire, developed by Queen Dam in 2004, consists of 34 items designed to assess the communication skills of adults. To determine its validity, Cronbach's alpha method was employed, resulting in an alpha value of 0.69, which indicates acceptable internal consistency. This value was 0.71 for student participants and 0.66 for high school students. Additionally, the reliability coefficient of the entire test, calculated using the halving method, was found to be 0.71 ([Hosseinchari and Fadakar, 2005](#)). The scoring range of this questionnaire is from 34 to 170.
- (3) **Teamwork Perceptions Questionnaire by [Castner \(2012\)](#) (Brief T-TPQ):** The Brief TeamSTEPPS Teamwork Perception Questionnaire includes five original subscales: team structure, team leadership, mutual support, situation monitoring, and communication, with four items in each subscale. Items were selected through an iterative process based on conceptual fit, scale reliability if deleted, and pilot factor loadings. Castner's study, which explained 64.63% of the variance, and Bartlett's test of sphericity, was significant ($p \geq 0.001$), indicating the alignment of items into multiple factors. The Cronbach's alpha scores for this research are as follows: total survey (0.93), peer relationships (0.92), leadership relationships (0.94) and bedside relationships (0.87).
- (4) **Raven's Adult IQ Test (RPMT):** Raven's IQ test, first developed in 1938 by John C. Raven in England, was initially designed for research on the genetic and environmental influences on intelligence. Over time, it became evident that the test could also be used to evaluate general intelligence. Since the test is independent of culture, it assesses the influence of genetics on intelligence, excluding environmental factors. This test evaluates various dimensions of intelligence, including attention to detail, conceptual reasoning, problem-solving, decoding, analysis, categorization, ordering, information processing, current intelligence, and cognitive abilities ([Qiu et al., 2020](#)). The score range for this test is between 40 and 160, with scores between 90 and 100 indicating average intelligence.
- (5) **Paul's Standard Work Risk Tolerance Questionnaire (PWRTQ) (2000):** Designed by Powell in 2000, this questionnaire consists of 21 items. In the research conducted by [Mahmoudi and Pourshahabi \(2022\)](#), both positive and negative correlations were observed between the subscales, indicating the favorable convergent and divergent validity of the questionnaire. Cronbach's alpha for this questionnaire is 0.75 ([Moghimi and Ramazan, 2019](#)). If scores fall between 38 and 63, the individual's risk-taking level is low; between 63 and 110, it is average; and above 110, it is high.
- (6) **Wooten Management Skills Questionnaire (WMSQ) (2001):** This standard management skills questionnaire, developed by Wooten *et al.* in 2000, includes 73 items that measure ten different management skills, each broken down into sub-skills. Wooten reported the validity of this questionnaire as favorable, and its reliability, as measured by Cronbach's alpha, was above 80. Scores ranging from 300 to 350 indicate weak management skills; between 350 and 432, they indicate average skills; and above 432 indicate very strong management skills.
- (7) **Eye-Tracking Glass - Moving Model (ETG):** The Eye-Tracking Glass - Moving Model (ETG) shares the same features as its fixed counterpart, but with the added advantage of being worn as glasses, allowing for tracking of eye movements even

during head and body movements. This enhances its usability. The device generates reports such as thermal maps and fixation reports, detailing the average observation time and the number of fixations points the user stares at. These outputs help analyze and depict the pattern of the viewer’s attention. One of the stimuli that can be presented in eye movement tracking is web pages (Valtakari *et al.*, 2021). For this study, the IT employees from knowledge-based companies were presented with four main pages: Yahoo, Sajad (comprehensive student affairs system), the assessment organization site, and Science Direct.

Procedure

First, ten knowledge-based companies were approached. Then, the performance of employees in the information technology departments of these companies was evaluated. From this group, one employee with the best performance in the recent company evaluations was selected from each company. These employees were chosen from the website design departments, as this department has a direct connection to analyzing eye movements in relation to visual interactions.

In the first stage, each of these employees was given a set of questionnaires:

- (1) Problem-Solving Inventory (**PSI**)
- (2) Communication Skills Test (**CSTR**)
- (3) Brief TeamSTEPPS Teamwork Perception Questionnaire (**Brief T-TPQ**)
- (4) Raven’s Progressive Matrices Test (**RPMT**)
- (5) Risk Tolerance Questionnaire (**PWRTQ**)
- (6) Wooten Management Skills Questionnaire (**WMSQ**)

These questionnaires were designed to assess the general capabilities of the employees. In addition, questions regarding their grade point average, type of degree, and the university they attended were also asked to evaluate their academic capabilities.

Next, in coordination with the psychology laboratory of Shahid Beheshti University, one hour was allocated for each employee to attend the laboratory. After the employees arrived at the laboratory, all ten participants were measured using an eye-tracking device.

For this study, to analyze the eye movements of employees from the website design department, visual stimuli in the form of pages from selected websites with simple and complex designs were presented. Familiar websites were chosen so that the participants were acquainted with the stimuli and could analyze the structure of the websites through visual processing.

The measurement was performed by displaying the main page images of four websites (Yahoo, Sajad Student Affairs System, Sanjeh Organization’s website, Science Direct) in front of the participants. After calibrating the device, the eye movement data of the participants were collected. The images of the first page of the websites shown during the test are presented in Table 2.

Table 2. The stimuli presented in the research

Row	Site name	Link
1	Yahoo	https://yahoo.com/
2	ScienceDirect	https://www.sciencedirect.com/
3	Comprehensive system of student affairs (Sajad)	https://portal.saorg.ir/
4	National Education Assessment Organization (Sanjesh)	https://sanjesh.org/
Source(s): The authors		

In the next step, after processing the eye movement data from the ten employees, ten students were selected as a comparison group. These students were shown the same website images, and their eye movement data was recorded. From the output data, participants whose eye movement patterns most closely matched the movement patterns of the employees were selected. Then, these selected participants were tested on their problem-solving ability, communication skills, teamwork spirit, intelligence, risk-taking, and management skills. The results from these tests were compared with the average scores of the employees to obtain a comprehensive analysis of the employees' competencies.

Table 3 shows the frequency distribution of each subgroup of participants in this study based on gender and age.

Analysis method

In this research, SPSS software the output of the thermal image, and the Tobii Pro Lab software were used to analyze the data and test the hypotheses.

In the first stage of the research, the general abilities of the employees of the website design department of knowledge-based companies were measured with a questionnaire. In the Table 4, the scores for each test are given separately by questionnaire and respondent.

Due to the importance of the validation indices of the eye tracking device, at firstthree validation indices of the sizes recorded by the device were calculated and checked for all subjects in all four groups, the results of which are presented in Table 5. These three indicators are deviation from the X-axis, deviation from the Y-axis, and tracking ratio.

According to the results of Table 5, it is clear that the tracking ratio and measurement deviation are proportional. Based on previous studies, considering 90 as a criterion for accepting the minimum tracking ratio and 1 as a criterion for accepting the maximum deviation from the X and Y axes, if people do not meet these criteria, they should be excluded from the analysis. In this way, there is no need to delete people's data, and all of them have an error lower than one degree and a tracking ratio higher than 90.

Heat map of knowledge workers

Heatmaps were generated from participants' eye-tracking data using Tobii Pro Lab. They provide a representation of the amount of visual attention on site pages. Figures 1–6 show the heat maps extracted from the sites presented to the knowledge workers.

The gaze paths of knowledge workers

Gaze paths were generated from participants' eye-tracking data using Tobii Pro Lab. They provide a visual representation of the time, place, duration, and order in which participants

Table 3. Demographic characteristics of participants in the research

	Gender	Age	Participant code		Gender	Age	Participant code
Students	Male	35	Student 1	Knowledge workers	Male	35	Participant 1
	Male	26	Student 2		Female	38	Participant 2
	Female	30	Student 3		Male	29	Participant 3
	Female	32	Student 4		Male	40	Participant 4
	Male	24	Student 5		Male	31	Participant 5
	Female	25	Student 6		Female	34	Participant 6
	Male	30	Student 7		Male	42	Participant 7
	Female	20	Student 8		Male	38	Participant 8
	Female	21	Student 9		Female	36	Participant 9
	Male	32	Student10		Female	39	Participant 10

Source(s): The authors

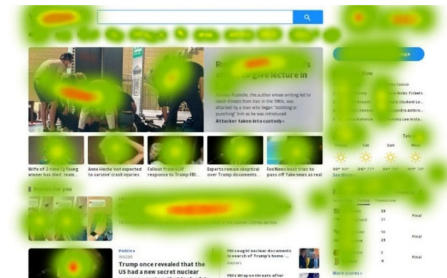
Table 4. The score table of the participants in the first stage of the research

Participant code	Participant 10	Participant 9	Participant 8	Participant 7	Participant 6	Participant 5	Participant 4	Participant 3	Participant 2	Participant 1
Variable										
Problem-solving ability	42	53	59	51	39	44	47	38	41	40
Communication skills	160	105	134	122	98	101	124	113	104	92
Teamwork	80	76	67	78	90	89	71	76	88	91
Intelligence	119	116	119	108	122	114	118	117	120	109
Risk-taking	81	78	76	91	109	83	94	98	85	101
Management skills	368	432	408	432	435	412	400	436	390	440
Degree of education	Master's degree	Master's degree	Bachelor's degree	Master's degree	P.H. D	Master's degree	Master's degree	Bachelor's degree	Master's degree	Master's degree
GPA	17	18	15	15	18	17	15	15	16	17
University	Payam Noor	Esfahan	Shahid Beheshti	Payam Noor	Tehran	Shahid Beheshti	Azad	Amir Kabir	Azad	Tehran
Source(s): The authors										

Table 5. The average and standard deviation of the validation indices of the eye tracking device (the unit of deviation is degree and the unit of tracking ratio is percentage)

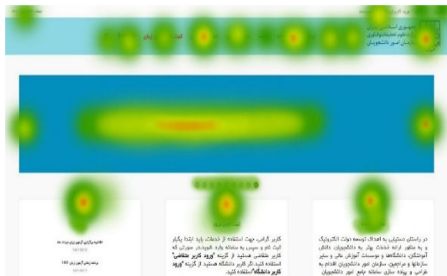
Number	Deviation from the X-axis		Deviation from the Y-axis		Tracking ratio	
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation
10	0/7	0/31	0/78	0/66	96/26	3/27

Source(s): The authors



Source(s): Figure by authors

Figure 1. Heat map of Yahoo! Website



Source(s): Figure by authors

Figure 2. Heat map of Sajad Website



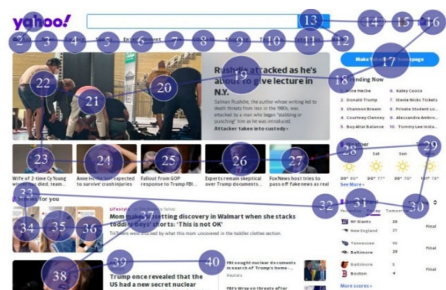
Source(s): Figure by authors

Figure 3. Heat map of Science Direct Website



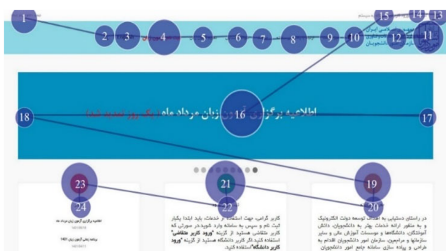
Source(s): Figure by authors

Figure 4. Heat map Sanjesh Website



Source(s): Figure by authors

Figure 5. Gaze path of Yahoo! Website



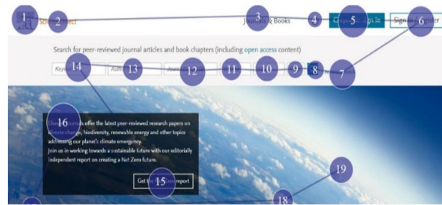
Source(s): Figure by authors

Figure 6. Gaze path of Sajad Website

individually fixated on different sections of the menu. From Figures 5–8, the gaze paths illustrating the movement trajectories of knowledge workers are presented.

In the second stage, among the 10 students whose movement paths were examined, only 5 aligned the direction of their gaze with that of knowledge workers. Below is an example of one student's eye movement pattern that matched the gaze direction of knowledge workers, as well as an example of students' eye movements that did not match. In Figures 9–12, the eye movement paths of two students are compared.

After eye movement tracking, tests of problem-solving ability, communication skills, teamwork spirit, intelligence, risk-taking, and management skills are taken from students whose gaze path map is close to the gaze path of employees. The Table 6 shows the results of these students' exams.



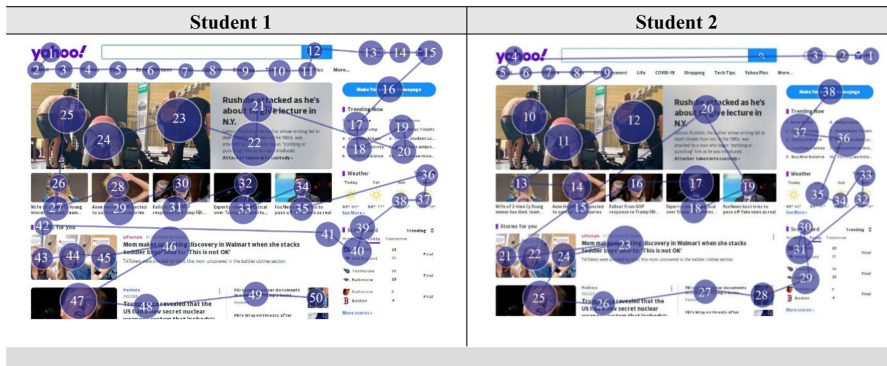
Source(s): Figure by authors

Figure 7. Gaze path of Science Direct Website



Source(s): Figure by authors

Figure 8. Gaze path of Sanjesh Website

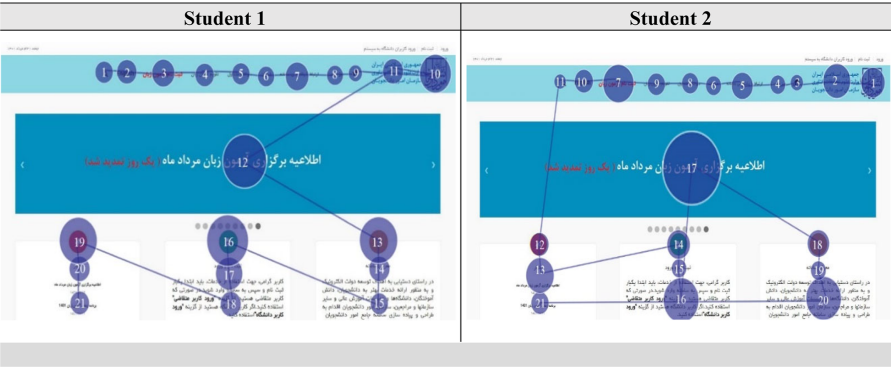


Source(s): Figure by authors

Figure 9. Gaze path of Yahoo! Website

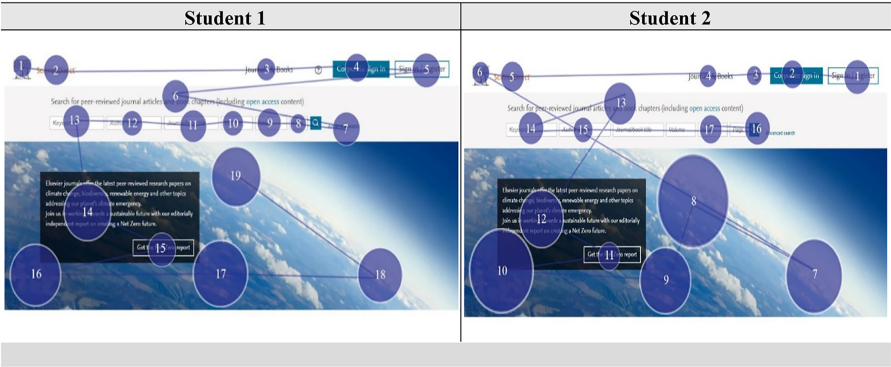
Conclusion

The results of this research show that to select knowledge workers effectively, attention should be paid to general skills (communication skills, problem-solving ability, karmic spirit, intelligence, scientific ability, risk-taking, management skills) and based on the knowledge nature of the desired job, abilities Applicants should be identified and proven. This study showed that in most recruitment and recruitment processes, these competencies are not monitored systematically and accurately. In this context, fundamental revisions must be made in the recruitment and selection units. The review of other research also proved that, on a case-by-case basis, sometimes several skills have been introduced and identified to increase efficiency and select (prospect) employees. In the following, we have tried to point out these common cases.



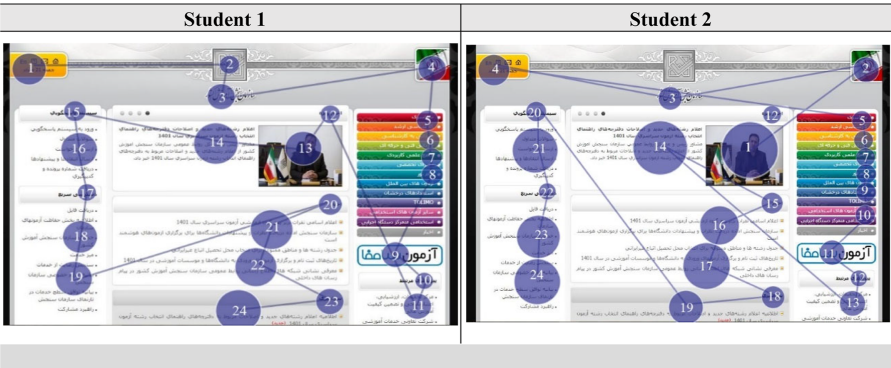
Source(s): Figure by authors

Figure 10. Gaze path of Sajad Website



Source(s): Figure by authors

Figure 11. Gaze path of Science Direct Website



Source(s): Figure by authors

Figure 12. Gaze path of Sanjesh Website

Table 6. The score table of the participants in the second stage of the research

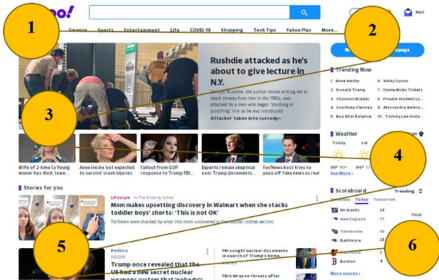
Participant code Variable	Student 10	Student 9	Student 8	Student 7	Student 6	Student 5	Student 4	Student 3	Student 2	Student 1
Problem-solving ability	43	130	112	39	109	99	45	40	106	41
Communication skills	164	109	112	149	104	103	170	155	145	169
Teamwork	86	59	45	79	53	42	82	65	69	70
Intelligence	123	99	98	116	106	102	119	119	115	121
Risk taking	89	83	82	90	91	89	93	106	86	91
Management skills	429	387	401	425	301	300	427	431	312	434
Degree of education	P.H. D	Bachelor's degree	Bachelor's degree	Master's degree	Bachelor's degree	Bachelor's degree	P.H. D	Bachelor's degree	P.H. D	P.H. D
GPA	17	15	13	16	14	14	16	17	16	17
University	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti	Shahid Beheshti
Comparison with the Eye-Tracking Pattern of Knowledge Workers	Match	Mismatch	Mismatch	Match	Mismatch	Mismatch	Match	Match	Mismatch	Match
Source(s): The authors										

Eye movement path

By examining the eye movement paths of knowledge workers, the general pattern derived from the images is illustrated in Figures 13–16 as follows.

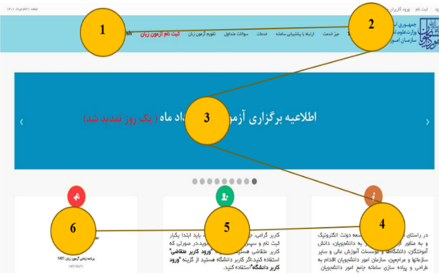
It can be said that for students whose eye movement patterns were closer to this general pattern, their general characteristics are also closer to the characteristics of high-performance knowledge workers. This conclusion was confirmed based on the questionnaires collected from the students in the second stage of the research.

In conclusion, this research highlights the significance of eye-tracking models in understanding the selection criteria for knowledge workers, particularly in the context of information technology companies in science and technology parks. By examining the correlation between eye movement patterns and general capabilities, this study reveals a



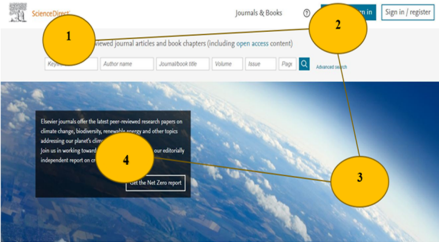
Source(s): Figure by authors

Figure 13. Eye movement path of Yahoo!



Source(s): Figure by authors

Figure 14. Eye movement path of Sajad



Source(s): Figure by authors

Figure 15. Eye movement path of Science Direct



Source(s): Figure by authors

Figure 16. Eye movement path of Sanjesh

noteworthy association between individuals exhibiting eye movement patterns akin to high-performance knowledge workers and possessing corresponding general characteristics. The findings underscore the potential of eye-tracking technology as a supplementary tool in the selection process, offering valuable insights into candidate suitability and enhancing the efficacy of talent acquisition strategies within knowledge-based industries. This research contributes to the ongoing discourse on innovative methodologies for identifying and recruiting adept knowledge workers, thus facilitating organizational success and competitiveness in dynamic market environments.

Furthermore, the research outcomes shed light on the practical implications for talent management and recruitment practices within knowledge-based companies. By leveraging eye-tracking technology alongside traditional assessment methods, organizations can refine their selection processes to target individuals with optimal aptitudes and traits conducive to high performance in knowledge-intensive roles. Additionally, identifying specific eye movement patterns associated with superior job performance provides a novel avenue for refining talent development initiatives and designing tailored training programs to nurture and amplify essential skills among prospective and current employees. Ultimately, this research underscores the value of integrating cutting-edge technology with established HR practices, paving the way for more informed and strategic decision-making in talent acquisition and management endeavors within the evolving landscape of knowledge-driven industries.

To explain the eye movements of the employees, it can be said that, from the point of view that these people knew the field of website design and web pages, most of their focus and gaze was on the general parts of the site and the arrangement of topics, headings, and buttons inside the sites. The staff checked the sites in a more specialized way (Hucko *et al.*, 2020). Much research has been conducted investigating the personality factors and characteristics of people with the eye movement path. Research conducted by Foulsham (2015), showed a significant influence of personality on the everyday control of eye movements. Also, several researches showed that how our eyes move is adjusted by our personality (Isaacowitz, 2005; Rauthmann *et al.*, 2012; Risko *et al.*, 2012; Baranes *et al.*, 2015). It can be concluded that in addition to allowing us to understand our surroundings, eye movements are a window into our minds and a rich source of information about who we are, how we feel, and what we are doing.

Jones and Brown (2020) conducted a comprehensive review and meta-analysis on the use of eye tracking in organizational research. They examined various studies that employed eye-tracking technology to explore human behavior within organizational contexts. The review highlighted the utility of eye tracking in uncovering implicit cognitive processes, attentional patterns, and decision-making mechanisms. The meta-analysis synthesized findings across studies, revealing significant relationships between eye movement metrics and various organizational phenomena. Overall, the paper provided valuable insights into the potential

applications of eye-tracking in organizational research and emphasized its importance in understanding human behavior in organizational settings.

Johnson and Wang (2018) present a concise summary of strategies and practices aimed at enhancing diversity and inclusion in the workplace in their article titled “Enhancing diversity and inclusion in the workplace: Strategies and practices” published in the Journal of Applied Behavioral Science. The paper outlines approach that organizations can adopt to promote diversity and inclusion, emphasizing the importance of both structural and cultural changes. By reviewing existing literature and empirical evidence, the authors offer insights into effective strategies such as diversity training, inclusive leadership, and diversity recruitment efforts. Overall, the article serves as a valuable resource for organizations seeking to create more inclusive and equitable work environments.

Smith (2019) investigates the relationship between gaze behavior and decision-making in recruitment using eye-tracking technology in their study published in the Human Resource Management Review. The research explores how recruiters’ eye movements influence their decision-making processes during the recruitment process. By employing eye-tracking technology, the study sheds light on the patterns of attention and visual cues that recruiters rely on when evaluating job candidates. The findings contribute to a better understanding of the role of gaze behavior in recruitment outcomes and provide insights for improving recruitment strategies.

References

- Aggarwal, R. (2013), “Selection of IT personnel through hybrid multi-attribute AHP-FLP approach”, *International Journal of Soft Computing and Engineering*, Vol. 2 No. 6, pp. 11-17.
- Akhavan Kharazian, M. and Sharifi, H. (2018), “Identifying and prioritizing social medias functions in small and medium enterprises from the perspective of Iranian experts”, *New Marketing Research Journal*, Vol. 7 No. 4, pp. 41-56.
- Ala-Luopa, S., Koivunen, S., Olsson, T. and Väänänen, K. (2024), “Considerations on human-AI collaboration in knowledge work–recruitment experts’ needs and expectations”, *HICSS*.
- Amar, A.D. and Mullaney, K. (2017), “Employee ability to innovate: how can organizations recognize it”, *Procedia computer science*, Vol. 122, pp. 494-501, doi: [10.1016/j.procs.2017.11.398](https://doi.org/10.1016/j.procs.2017.11.398).
- Aulin, R., Ek, Å. and Edling, C. (2019), “Underlying causes for risk taking behaviour among construction workers”, *10th Nordic Conference on Construction Economics and Organization*, Vol. 2, Emerald Publishing, pp. 419-426, doi: [10.1108/s2516-285320190000002012](https://doi.org/10.1108/s2516-285320190000002012).
- Aydogmus, C. (2019), “Millennial knowledge workers: the roles of protean career attitudes and psychological empowerment on the relationship between emotional intelligence and subjective career success”, *Career Development International*, Vol. 24 No. 4, pp. 297-314, doi: [10.1108/cdi-06-2018-0165](https://doi.org/10.1108/cdi-06-2018-0165).
- Baranes, A., Oudeyer, P.Y. and Gottlieb, J. (2015), “Eye movements reveal epistemic curiosity in human observers”, *Vision Research*, Vol. 117, pp. 81-90, doi: [10.1016/j.visres.2015.10.009](https://doi.org/10.1016/j.visres.2015.10.009).
- Bartkowiak, G., Krugielka, A., Dachowski, R., Gałek, K. and Kostrzewa-Demczuk, P. (2021), “Attitudes of Polish entrepreneurs towards knowledge workers aged 35 and above”, *Journal of Business Research*, Vol. 64 No. 6, pp. 1234-1247, doi: [10.1016/j.jclepro.2020.124366](https://doi.org/10.1016/j.jclepro.2020.124366).
- Bassett-Jones, N. (2023), *Strategic Human Resource Management: A Systems Approach*, Routledge, London.
- Bhandari, S., Hallowell, M.R., Alruqi, W. and Salas, R. (2021), “Modeling the relationship between personal risk tolerance, work-related risk tolerance, and risk-taking behavior of construction workers”, *Journal of Construction Engineering and Management*, Vol. 147 No. 4, 04021016, doi: [10.1061/\(asce\)co.1943-7862.0002021](https://doi.org/10.1061/(asce)co.1943-7862.0002021).
- Blank, T.H. (2024), “Developing incremental innovation in the high-tech industry: the effect of age and tenure in research and development teams”, *Cross Cultural and Strategic Management*, Vol. 31 No. 2, pp. 195-211, doi: [10.1108/CCSM-04-2023-0054](https://doi.org/10.1108/CCSM-04-2023-0054).

- Bourgault, J., Charih, M., Maltais, D. and Rouillard, L. (2006), "Hypotheses concerning the prevalence of competencies among government executives, according to three organizational variables", *Public Personnel Management*, Vol. 35 No. 2, pp. 89-119, doi: [10.1177/009102600603500201](https://doi.org/10.1177/009102600603500201).
- Buettner, R., Röttger, P. and Schulze, J. (2018a), "Eye tracking as a research tool in organizational psychology: applications and perspectives", *Frontiers in Psychology*, Vol. 9, p. 1640, doi: [10.3389/fpsyg.2018.01640](https://doi.org/10.3389/fpsyg.2018.01640).
- Buettner, R., Sauer, S., Maier, C. and Eckhardt, A. (2018b), "Real-time prediction of user performance based on pupillary assessment via eye tracking", *AIS Transactions on Human-Computer Interaction*, Vol. 10 No. 1, pp. 26-56, doi: [10.17705/1thci.00103](https://doi.org/10.17705/1thci.00103).
- Castner, J. (2012), "Validity and reliability of the brief TeamSTEPPS teamwork perceptions questionnaire", *Journal of Nursing Measurement*, Vol. 20 No. 3, pp. 186-198, doi: [10.1891/1061-3749.20.3.186](https://doi.org/10.1891/1061-3749.20.3.186).
- Choudhury, A., Gupta, P. and Mandal, S. (2024), "Hybrid AI methodologies in HR: a path to inclusive and efficient talent acquisition", *International Journal of Business Analytics*, Vol. 11 No. 2, pp. 1-19.
- Chuang, C.H., Jackson, S.E. and Jiang, Y. (2016), "Can knowledge-intensive teamwork be managed? Examining the roles of HRM systems, leadership, and tacit knowledge", *Journal of management*, Vol. 42 No. 2, pp. 524-554, doi: [10.1177/0149206313478189](https://doi.org/10.1177/0149206313478189).
- Cobo, C. (2013), "Skills and competencies for knowmadic workers", in *Knowmad Society*, pp. 57-88.
- Erhardt, N. (2011), "Is it all about teamwork? Understanding processes in team-based knowledge work", *Management Learning*, Vol. 42 No. 1, pp. 87-112, doi: [10.1177/1350507610382490](https://doi.org/10.1177/1350507610382490).
- Etkina, E., Karelina, A., Ruibal-Villasenor, M., Rosengrant, D., Jordan, R. and Hmelo-Silver, C.E. (2010), "Design and reflection help students develop scientific abilities: learning in introductory physics laboratories", *The Journal of the Learning Sciences*, Vol. 19 No. 1, pp. 54-98, doi: [10.1080/10508400903452876](https://doi.org/10.1080/10508400903452876).
- Farahmand, N.F.H. (2020), "Human capital development reforming managerial actions", *Journal of Management and Economic Studies*, Vol. 2 No. 2, pp. 129-134, doi: [10.26677/tr1010.2020.607](https://doi.org/10.26677/tr1010.2020.607).
- Foulsham, T. (2015), "Eye movements and their functions in everyday tasks", *Eye*, Vol. 29 No. 2, pp. 196-199, doi: [10.1038/eye.2014.275](https://doi.org/10.1038/eye.2014.275).
- Girsang, R.M., Tarigan, W.J. and Sipayung, T. (2023), "The effect of recruitment and selection on employee performance. Enrichment", *Journal of Management*, Vol. 13 No. 1, pp. 84-95.
- Greene, R.J. (2024), "Maximizing the effectiveness of knowledge workers", *The Journal of Total Rewards*, Vol. 33 No. 2, p. 4.
- Hamdan Mansour, A., Al Shibi, A.N., Khalifeh, A.H. and Hamdan Mansour, L.A. (2020), "Health-care workers' knowledge and management skills of psychosocial and mental health needs and priorities of individuals with COVID-19", *Mental Health and Social Inclusion*, Vol. 24 No. 3, pp. 135-144, doi: [10.1108/mhsl-04-2020-0022](https://doi.org/10.1108/mhsl-04-2020-0022).
- Hassanzadeh, S., Hassanzadeh, T., Sadeq, M. and Nakisa, S. (2014), "Explaining the relationship between intellectual capital and knowledge productivity", *Smart Business Management Studies*, Vol. 3 No. 10, pp. 39-58.
- Heller, K.A. (2007), "Scientific ability and creativity", *High Ability Studies*, Vol. 18 No. 2, pp. 209-234, doi: [10.1080/13598130701709541](https://doi.org/10.1080/13598130701709541).
- Hendarman, A.F. and Tjakraatmadja, J.H. (2012), "Relationship among soft skills, hard skills, and innovativeness of knowledge workers in the knowledge economy era", *Procedia-Social and Behavioral Sciences*, Vol. 52, pp. 35-44, doi: [10.1016/j.sbspro.2012.09.439](https://doi.org/10.1016/j.sbspro.2012.09.439).
- Hepner, P.P. and Petersen, C.H. (1982), "The development and implications of a personal problem-solving inventory", *Journal of Counseling Psychology*, Vol. 29 No. 1, pp. 66-75, doi: [10.1037/0022-0167.29.1.66](https://doi.org/10.1037/0022-0167.29.1.66).
- Hock-Doepgen, M., Claus, T., Kraus, S. and Cheng, C.F. (2021), "Knowledge management capabilities and organizational risk-taking for business model innovation in SMEs", *Journal of Business Research*, Vol. 130, pp. 683-697, doi: [10.1016/j.jbusres.2019.12.001](https://doi.org/10.1016/j.jbusres.2019.12.001).

- Hosseinchari, M. and Fadakar, M.M. (2005), "Studying the impact of university on communication skills based on a comparison of students and undergraduates", *Daneshvar Behaviour*, Vol. 12 No. 15 (Special Papers on Educational Sciences 5), pp. 21-32, SID, available at: <https://sid.ir/paper/46387/fa>
- Hosseingholizadeh, R., Mahdi, S.E.K. and El-Farr, H. (2016), "The role of motivation, ability, and opportunity in achieving effective knowledge-work: knowledge work and MAO", *International Journal of Knowledge Management (IJKM)*, Vol. 12 No. 4, pp. 20-36, doi: [10.4018/ijkm.2016100102](https://doi.org/10.4018/ijkm.2016100102).
- Hucko, M., Moro, R. and Bielikova, M. (2020), "Confusion detection dataset of mouse and eye movements", *Adjunct Publication of the 28th ACM Conference on User Modeling, Adaptation and Personalization*, pp. 281-286, doi: [10.1145/3386392.3399289](https://doi.org/10.1145/3386392.3399289).
- Isaacowitz, D.M. (2005), "The gaze of the optimist", *Personality and Social Psychology Bulletin*, Vol. 31 No. 3, pp. 407-415, doi: [10.1177/0146167204271599](https://doi.org/10.1177/0146167204271599).
- Johari, J., Shamsudin, F.M., Zainun, N.F.H., Yean, T.F. and Yahya, K.K. (2022), "Institutional leadership competencies and job performance: the moderating role of proactive personality", *International Journal of Educational Management*, Vol. 36 No. 6, pp. 1027-1045, doi: [10.1108/ijem-07-2021-0280](https://doi.org/10.1108/ijem-07-2021-0280).
- Johnson, P.A. and Wang, L. (2018), "Enhancing diversity and inclusion in the workplace: strategies and practices", *The Journal of Applied Behavioral Science*, Vol. 54 No. 2, pp. 127-152.
- Jones, R.L. and Brown, K.D. (2020), "Eye tracking in organizational research: a review and meta-analysis", *Organizational Behavior and Human Decision Processes*, Vol. 157, pp. 1-18.
- Kang, H., Kweon, S.O. and Choi, S. (2022), "Using eye-tracking to examine the role of first and second language glosses", *Language Teaching Research*, Vol. 26 No. 6, pp. 1252-1273, doi: [10.1177/1362168820928567](https://doi.org/10.1177/1362168820928567).
- Kubátová, J. (2012), "Growth of collective intelligence by linking knowledge workers through social media", *LESIJ-Lex ET Scientia International Journal*, Vol. 19 No. 1, pp. 135-145.
- Lewis-Gunn, V. (2022), "Incentive packages within the human resource department: a qualitative study of motivation", Doctoral dissertation, Northcentral University.
- Li, Y., Chen, Z. and Zhang, H. (2023), "AI-driven talent acquisition: predictive analytics for improving hiring outcomes", *Journal of Business Research*, Vol. 156, pp. 113-125, doi: [10.1016/j.jbusres.2023.02.018](https://doi.org/10.1016/j.jbusres.2023.02.018).
- Lonsdale, C., Sanderson, J. and Esfahbodi, A. (2024), "Good team players? The impact of team member knowledge, skills and abilities on sourcing teamwork and sourcing task-work effectiveness", *Supply Chain Management: An International Journal*, Vol. 29 No. 5, pp. 835-851, doi: [10.1108/scm-10-2023-0529](https://doi.org/10.1108/scm-10-2023-0529).
- Low, B.K.L., Man, S.S., Chan, A.H.S. and Alabdulkarim, S. (2019), "Construction worker risk-taking behavior model with individual and organizational factors", *International Journal of Environmental Research and Public Health*, Vol. 16 No. 8, p. 1335, doi: [10.3390/ijerph16081335](https://doi.org/10.3390/ijerph16081335).
- Mahmoudi, J. and Pourshahabi, V. (2022), "Investigating the effect of financial intelligence value on employees' risk taking with the mediating role of social capital", *Journal of Value Creating in Business Management*, Vol. 2 No. 4, pp. 24-45, doi: [10.22034/jvcbm.2023.314246.1009](https://doi.org/10.22034/jvcbm.2023.314246.1009).
- Man, S.S., Chan, A.H. and Wong, H.M. (2017), "Risk-taking behaviors of Hong Kong construction workers—A thematic study", *Safety Science*, Vol. 98, pp. 25-36, doi: [10.1016/j.ssci.2017.05.004](https://doi.org/10.1016/j.ssci.2017.05.004).
- Manuti, A. and Monachino, D. (2020), "Managing knowledge at the time of artificial intelligence: an explorative study with knowledge workers", *East European Journal of Psycholinguistics*, Vol. 7 No. 2, pp. 179-190, doi: [10.29038/eejpl.2020.7.2.man](https://doi.org/10.29038/eejpl.2020.7.2.man).
- Moghim, S.M. and Ramazan, M. (2019), *Organizational Psychology*, Radhan Publisher, Tehran.
- Muzam, J. (2023), "The challenges of modern economy on the competencies of knowledge workers", *Journal of the Knowledge Economy*, Vol. 14 No. 2, pp. 1635-1671, doi: [10.1007/s13132-022-00979-y](https://doi.org/10.1007/s13132-022-00979-y).

- Mwantu, E.N., Supji, M.P., Aimuamwosa, I., Oluwafemi, O.O. and Itse, Y.I. (2021), "Employee creativity and workplace technological innovation on problem-solving in twenty-first century organizations", *NIU Journal of Social Sciences*, Vol. 6 No. 4, pp. 155-166.
- Nguyen, P.T., Yandi, A. and Mahaputra, M.R. (2020), "Factors that influence employee performance: motivation, leadership, environment, culture organization, work achievement, competence and compensation (A study of human resource management literature studies)", *Dinasti International Journal of Digital Business Management*, Vol. 1 No. 4, pp. 645-662.
- Nguyen, T., Pham, H. and Le, D. (2022), "Enhancing recruitment processes through AI: the case for NLP and psychometric integration", *Journal of Artificial Intelligence Research*, Vol. 78 No. 4, pp. 623-647.
- O'Connell, T.P. and Walther, D.B. (2015), "Dissociation of salience-driven and content-driven spatial attention to scene category with predictive decoding of gaze patterns", *Journal of Vision*, Vol. 15 No. 5, p. 20, doi: [10.1167/15.5.20](https://doi.org/10.1167/15.5.20).
- Ouedraogo, I., Tabi, H.N., Ondo, H.A. and Jiya, A.N. (2022), "Institutional quality and human capital development in Africa", *Economic Systems*, Vol. 46 No. 1, 100937, doi: [10.1016/j.ecosys.2021.100937](https://doi.org/10.1016/j.ecosys.2021.100937).
- Poursaid, M. and Ashuri, J. (2013), "Development of a model for the selection of employees based on the climatic approaches of the Iranian Islamic model of progress", *Human Resource Management Research*, Vol. 6 No. 3, pp. 1-25.
- Qiu, C., Hatton, R. and Hou, M. (2020), "Variations in Raven's Progressive Matrices scores among Chinese children and adolescents", *Personality and Individual Differences*, Vol. 164, 110064, doi: [10.1016/j.paid.2020.110064](https://doi.org/10.1016/j.paid.2020.110064).
- Rauthmann, J.F., Seubert, C.T., Sachse, P. and Furtner, M.R. (2012), "Eyes as windows to the soul: gazing behavior is related to personality", *Journal of Research in Personality*, Vol. 46 No. 2, pp. 147-156, doi: [10.1016/j.jrp.2011.12.010](https://doi.org/10.1016/j.jrp.2011.12.010).
- Risko, E.F., Anderson, N.C., Lanthier, S. and Kingstone, A. (2012), "Curious eyes: individual differences in personality predict eye movement behavior in scene-viewing", *Cognition*, Vol. 122 No. 1, pp. 86-90, doi: [10.1016/j.cognition.2011.08.014](https://doi.org/10.1016/j.cognition.2011.08.014).
- Ryan, T.P. (2013), *Sample Size Determination and Power*, John Wiley & Sons, Hoboken, NJ.
- Saniuk, S., Caganova, D. and Saniuk, A. (2023), "Knowledge and skills of industrial employees and managerial staff for the industry 4.0 implementation", *Mobile Networks and Applications*, Vol. 28 No. 1, pp. 220-230, doi: [10.1007/s11036-021-01788-4](https://doi.org/10.1007/s11036-021-01788-4).
- Schemmer, M., Kühl, N. and Satzger, G. (2021), "Intelligent decision assistance versus automated decision-making: enhancing knowledge work through explainable artificial intelligence", *arXiv preprint*, arXiv:2109.13827.
- Semertzaki, E. (2017), "Knowledge management skills applicable to information management—information management skills applicable to knowledge management in an organization", in *The Emerald Handbook of Modern Information Management*, Emerald Publishing, pp. 571-604.
- Shet, S. and Nair, B. (2023), "Quality of hire: expanding the multi-level fit employee selection using machine learning", *International Journal of Organizational Analysis*, Vol. 31 No. 6, pp. 2103-2117, doi: [10.1108/ijoa-06-2021-2843](https://doi.org/10.1108/ijoa-06-2021-2843).
- Smith, J.M. (2019), "Gaze behavior and decision-making in recruitment: a study using eye-tracking technology", *Human Resource Management Review*, Vol. 29 No. 1, pp. 56-68.
- Smith, J., Patel, R. and Thompson, K. (2023), "Blended approaches to recruitment: integrating traditional HR tools with AI", *HR Analytics Review*, Vol. 7 No. 1, pp. 45-60.
- Surawski, B. (2019), "Who is a 'knowledge worker'—clarifying the meaning of the term through comparison with synonymous and associated terms", *Management*, Vol. 23 No. 1, pp. 105-133, doi: [10.2478/manment-2019-0007](https://doi.org/10.2478/manment-2019-0007).
- Teoh Yi Zhe, I. and Keikhosrokiani, P. (2021), "Knowledge workers mental workload prediction using optimised ELANFIS", *Applied Intelligence*, Vol. 51 No. 4, pp. 2406-2430, doi: [10.1007/s10489-020-01928-5](https://doi.org/10.1007/s10489-020-01928-5).

- Toth, I., Heinänen, S. and Puumalainen, K. (2021), "Passionate and engaged? Passion for inventing and work engagement in different knowledge work contexts", *International Journal of Entrepreneurial Behavior and Research*, Vol. 27 No. 9, pp. 1-25, doi: [10.1108/ijeb-09-2020-0632](https://doi.org/10.1108/ijeb-09-2020-0632).
- Valtakari, N.V., Hooge, I.T., Viktorsson, C., Nyström, P., Falck-Ytter, T. and Hessels, R.S. (2021), "Eye tracking in human interaction: possibilities and limitations", *Behavior Research Methods*, Vol. 53 No. 4, pp. 1-17, doi: [10.3758/s13428-020-01517-x](https://doi.org/10.3758/s13428-020-01517-x).
- Van Laar, E., Van Deursen, A.J., Van Dijk, J.A. and De Haan, J. (2020), "Determinants of 21st-century skills and 21st-century digital skills for workers: a systematic literature review", *Sage Open*, Vol. 10 No. 1, 2158244019900176, doi: [10.1177/2158244019900176](https://doi.org/10.1177/2158244019900176).
- Vathanophas, V. and Thai-ngam, J. (2007), "Competency requirements for effective job performance in the Thai public sector", *Contemporary Management Research*, Vol. 3 No. 1, pp. 45-70, doi: [10.7903/cmr.49](https://doi.org/10.7903/cmr.49).
- Veteläinen, J.-M.S. (2023), "The link between cognitive strain and ability to perform well in the knowledge work", Master's thesis, University of Vaasa, School of Technology and Innovations.
- Wedel, M., Pieters, R. and van der Lans, R. (2023), "Modeling eye movements during decision making: a review", *Psychometrika*, Vol. 88 No. 2, pp. 697-729, doi: [10.1007/s11336-022-09876-4](https://doi.org/10.1007/s11336-022-09876-4).
- Werdhiastutie, A., Suhariadi, F. and Partiw, S.G. (2020), "Achievement motivation as antecedents of quality improvement of organizational human resources", *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, Vol. 3 No. 2, pp. 747-752, doi: [10.33258/birci.v3i2.886](https://doi.org/10.33258/birci.v3i2.886).
- Zhang, X., Xu, T., Wei, X., Tang, J. and Ordonez de Pablos, P. (2024), "The establishment of transactive memory system in distributed agile teams engaged in AI-related knowledge work", *Journal of Knowledge Management*, Vol. 28 No. 2, pp. 381-408, doi: [10.1108/jkm-10-2022-0791](https://doi.org/10.1108/jkm-10-2022-0791).
- Zhou, J. and Cen, W. (2023), "Design and application research of a digital human resource management platform based on ChatGPT", *Journal of Theory and Practice of Social Science*, Vol. 3 No. 7, pp. 49-57.

Corresponding author

Mahshid Pourhosein can be contacted at: mahshid.pourhosein@gmail.com