



Enhancing Strategic Thinking in Isfahan Sports Managers: A Comparative Study of Developmental Assessment Centers Versus Bloom's Cognitive Model-Based Training

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Abstract

This study aimed to evaluate the effectiveness of two approaches—Developmental Assessment Centers and a training program based on Bloom's cognitive model—in enhancing strategic thinking among sports managers in Isfahan. A quasi-experimental design was employed, with 36 managers from the Isfahan Sports and Youth Department purposively selected based on guidelines by Murphy & Myors (1999). The interventions included simulation exercises such as in-basket simulations, leaderless group discussions, case studies, and oral presentations. Strategic thinking outcomes were measured using the Philip & Patricia (2001) questionnaire. Data analysis via ANCOVA revealed no significant differences between the dimension-based assessment center, task-based assessment center, and Bloom's cognitive model-based training in improving strategic thinking ($p > 0.05$). However, Cohen's effect size analysis highlighted that the task-based assessment center had the most substantial impact on enhancing strategic thinking ($d = 1.54$), followed closely by the training based on Bloom's cognitive model ($d = 1.50$), and lastly by the dimension-based assessment center ($d = 1.43$). These findings suggest that while all three approaches are effective, the task-based assessment center is slightly more effective than the other methods. Therefore, the study recommends prioritizing task-based assessment centers in organizational training programs to better develop strategic thinking skills among sports managers, offering a more nuanced and impactful approach to addressing complex strategic challenges.

Keywords: ANCOVA, Bloom's cognitive model, Developmental Assessment Center quasi-experimental study

1. Introduction

In today's complex and changing conditions, programs for the In today's intricate and ever-evolving societal landscape, organizations place paramount importance on developing managerial capabilities across various levels of management. Such programs are meticulously crafted with the overarching goal of enhancing efficiency and effectiveness in organizational activities. Whether governmental or non-governmental, organizations universally grapple with the challenge of selecting, training, and professionally nurturing adept and impactful managers. The multifaceted nature of managerial roles necessitates a comprehensive blend of competencies, skills, abilities, and distinctive attributes for successful performance within an organization (Mousazadeh & Adli, 2009). Among these attributes, proficiency in quantitative strategic thinking stands out as pivotal. Strategic thinking has emerged as a critical competency in the realm of management, particularly in the context of rapidly changing and complex organizational environments. As organizations increasingly face global competition, technological advancements, and evolving consumer demands, the ability of managers to think strategically is pivotal for long-term success. Strategic thinking involves not only the formulation of strategies but also the ability to anticipate, innovate, and make decisions that align with an organization's goals and values (Liedtka, 1998). According to Goldman (2008) and Goldman & Casey (2010), strategic thinking is essential for identifying opportunities for competitive advantage and for guiding organizations through periods of uncertainty. Strategic thinking serves as a cornerstone skill for leaders (Collins et al., 2000). Numerous studies have emphasized the importance of strategic thinking for effective leadership and organizational performance. For instance, Bonn (2005) highlights that strategic thinking enables leaders to navigate complex environments by synthesizing information and generating innovative solutions. Similarly, Pisapia et al. (2005) argue that strategic thinking is a key determinant of organizational adaptability and long-term sustainability. These findings underscore the need for developing strategic thinking skills among managers to enhance organizational resilience and performance. Consequently, enhancing strategic thinking abilities among managers emerges as a linchpin in effective strategic management processes, with any initiatives in this direction assuming central importance (Suri, 2014). One particularly effective method in realizing this goal is through the utilization of assessment centers (AC) (Thornton & Rupp, 2006).

Assessment center is a methodology employed in organizational behavior, work psychology, and organizational psychology for assessment and decision-making purposes (Tripathy, 2016; Bayham, 2010). This approach aims to replicate real-world work scenarios through simulation exercises, wherein participants (assessors or volunteers) engage with complex stimuli, and their behaviors are systematically observed, recorded, and scored (Arthur & Day, 2011; Khoshoei, 2013; Oliver et al., 2014). Assessment centers represent a conventional technique utilized to forecast an individual's prospective career achievements by evaluating various attributes and dimensions. Termed as dimensional assessment centers, these assessments are grounded in job analysis, focusing on knowledge, skills, abilities, and other personality traits (KSAOs) derived from job specifications (Jackson et al., 2022; Hoffman et al., 2011). Lowry (1996, 1997) posits that assessment centers primarily evaluate behavioral competencies through simulation exercises rather than merely assessing traits and structures. On this premise, he discerns two categories of assessment centers: dimension-based and task-based. Task-based assessment centers offer a novel approach closer to real-world job demands compared to their dimension-based counterparts. These centers prioritize task analysis, emphasizing the importance of job-related activities rather than solely focusing on individual dimensions. Task-based assessment centers assess participants' ability to execute job tasks effectively, following a rigorous job task identification and prioritization process (Lance, 2012). Consequently, task-based assessment

centers underscore the significance of simulation exercises as a primary measure of work-related behaviors (Hall, 2010). Distinguishing itself from traditional assessment methods, the assessment center process evaluates not only knowledge but also the skills and abilities requisite for task performance. Furthermore, participants typically perceive assessment centers as fairer and more job-relevant compared to other evaluation methods, contributing to a lower likelihood of contesting evaluation outcomes, even in cases of suboptimal performance (International Workforce Guide for Assessment centers, 2009). Indeed, assessment centers stand as a benchmark technique for prognosticating individuals' future career trajectories through the assessment of traits and dimensions.

The assessment center method comprises four key components. Firstly, the competence or dimension component pertains to human attributes and job-related tasks aligned with organizational objectives, facilitating the assessment of participants' competency levels in these dimensions (Chen, 2006; Gatwood et al., 2008). Secondly, simulation exercises represent a crucial component wherein organizational or work scenarios are replicated to evaluate participant behavior (Rupp et al., 2006; Thornton & Rupp, 2006). The third component involves the participants themselves. Lastly, the assessor, as the fourth component, assesses the participant's performance in simulation exercises (Khoshoei, 2011). Within simulation exercises, assessors undertake five essential tasks, encompassing observation, recording, classification, rating, and providing feedback to participants (Thornton, 2006; Thornton & Rupp, 2006).

Assessment centers have been widely recognized as an effective method for evaluating and developing managerial competencies, including strategic thinking. Originating in the 1940s, assessment centers have evolved into a sophisticated tool used across various industries to assess the potential and performance of individuals in managerial roles (Thornton & Byham, 1982). The methodology typically involves a series of simulation exercises designed to replicate real-world challenges that managers might face, allowing assessors to observe and evaluate participants' behaviors and decision-making processes (Arthur et al., 2003).

Empirical research supports the efficacy of assessment centers in predicting managerial success and enhancing relevant skills. Gaugler et al. (1987) conducted a meta-analysis of assessment center validity, concluding that assessment centers are a robust predictor of managerial performance. More recent studies have explored the specific impact of assessment centers on strategic thinking. For example, a study by Güttel and Konlechner (2009) found that assessment centers that incorporate complex problem-solving exercises can significantly improve participants' strategic thinking capabilities.

Moreover, the distinction between dimension-based and task-based assessment centers has gained attention in recent literature. Dimension-based centers focus on evaluating specific competencies, such as leadership or communication skills, while task-based centers are designed around the completion of specific tasks that mimic job-related challenges (Jackson et al., 2022; Hoffman et al., 2011). Lance (2012) argues that task-based assessment centers, which closely mirror actual job demands, are more effective in developing practical skills, including strategic thinking. This is supported by Hale (2010), who found that task-based approaches lead to greater improvements in job performance compared to dimension-based methods.

Bloom's Taxonomy, developed by Benjamin Bloom in 1956, categorizes educational objectives into six cognitive domains: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation (Bloom, 1994). This framework has been extensively used in educational settings to structure learning outcomes and assessments. In the context of management training, Bloom's cognitive model has been adapted to design programs that enhance higher-order thinking skills, such as strategic thinking (Anderson & Krathwohl, 2001).

Several studies have explored the effectiveness of training programs based on Bloom's cognitive model in developing managerial competencies. For instance, Wang and Farmer (2008) demonstrated that management training programs structured around Bloom's Taxonomy can significantly improve managers' decision-making and problem-solving abilities. Similarly, Thompson et al. (2013) found that integrating Bloom's cognitive domains into leadership development programs enhanced participants' ability to analyze complex situations and develop strategic solutions.

However, there is limited research directly comparing the effectiveness of assessment centers and Bloom's cognitive model-based training in developing strategic thinking. The few studies that do exist suggest that while both approaches are beneficial, they may offer different advantages depending on the specific competencies being targeted. For example, a study by Brown (1991) compared the outcomes of traditional training programs and assessment centers, finding that assessment centers were more effective in improving practical, job-related skills, while traditional training programs were better at enhancing theoretical knowledge.

The rationale for focusing on sports managers stems from the unique challenges they face in navigating complex and competitive environments. In the context of sports management, strategic thinking is critical for adapting to rapidly changing conditions, making informed decisions, and maintaining a competitive edge. However, despite its importance, strategic thinking among sports managers has not been extensively studied, particularly in the Iranian context, where the dynamics of sports management present unique challenges and opportunities. This gap highlights the need for targeted interventions to enhance the strategic capabilities of sports managers, which, in turn, can have a significant impact on the overall performance and success of sports organizations.

Strategic thinking, essential for managerial success, involves skills like analysis, synthesis, and decision-making. The study examines how different methods—dimension-based assessment centers, task-based assessment centers, and training based on Bloom's taxonomy—impact strategic thinking.

1. **Dimension-Based Assessment Centers** focus on developing cognitive competencies like problem-solving and decision-making, which are core to strategic thinking. They're expected to enhance abstract, long-term planning abilities.
2. **Task-Based Assessment Centers** emphasize applying strategic thinking to real-world tasks. This approach is likely to improve practical, job-specific decision-making skills.
3. **Bloom's Taxonomy-Based Training** progresses through cognitive levels, from basic knowledge to evaluation. This comprehensive approach is designed to enhance both understanding and practical application of strategic thinking.

The differences in these methods align with the various cognitive and practical demands of strategic thinking, suggesting that each approach will have distinct effects on enhancing this critical managerial skill.

Given the critical role of strategic thinking in managerial effectiveness and the potential of developmental assessment centers and educational training to enhance these skills, this study aims to address the following research questions:

1. Research Question 1: Do developmental assessment centers (both task-based and dimension-based) and education based on Bloom's cognitive dimensions differ in their effectiveness at improving strategic thinking among sports managers?
2. Research Question 2: Is there a significant difference in the efficacy of dimension-based versus task-based developmental assessment centers in enhancing strategic thinking among sports managers?

By investigating these questions, this study seeks to determine which approach-assessment centers or Bloom's cognitive model-based training most effectively enhances the strategic thinking skills of sports managers in Isfahan. The outcomes of this research will offer valuable insights for organizations seeking to optimize their training and development programs for managers, particularly within the context of sports management.

2. Methodology

2.1. Research Design and Population

The experimental design employed in this study entails random assignment from three levels of Randomized Controlled Trials (RCT), albeit without random selection. The interventions, as elucidated in subsequent sections, encompass two variants of developmental assessment centers and direct education based on Bloom's cognitive dimensions. These interventions and the dependent variable are visually represented in Table 1. Data analysis was conducted using SPSS software, and one-way analysis of covariance (ANCOVA) was employed for analysis. Notably, the requisite number of managers within Isfahan Province's Department of Sports and Youth was unavailable for four groups. Considering Cohen's effect size (d), a minimum group size of 12 individuals was determined. Furthermore, adhering to the concept of effect size mitigates the necessity for a control group. Omitting the control group in this study was deemed appropriate since discerning the intervention's efficacy would have been challenging without a significant difference between the three groups before the intervention introduction. Effect size facilitates the measurement of intervention impact within each group independently of a control group.

Traditionally, control groups should also receive interventions or be placed on a waiting list. However, this waiting period may induce an irrational aspect or provoke a compensatory reaction within the control group, rendering it unsuitable for this study's context. While in clinical research, control groups often receive placebos, such an approach was deemed irrelevant in this study. Consequently, the decision to forgo a control group was made to ensure the study's integrity and relevance to its specific context.

Table 1. Research design

| | Intervention | The dependent variable | Research design |
|---|--|------------------------|-----------------|
| Dimension-based developmental center | Dimension-based developmental center = X 1 | Strategic thinking | O21 X1 O11 |
| Task-based developmental center | Task-based developmental center = X 2 | Strategic thinking | O22 X2 O12 |
| Education based on Bloom's dimensionality | Education = X 3 | Strategic thinking | O23 X3 O13 |

The research population comprised all city managers within the Sports and Youth Department of Isfahan Province (in Iran), from whom 36 individuals were purposefully selected to partake in the assessment center. The sample size was determined using G Power software, akin to the methodology outlined by Murphy & Mewers (1999), with $\alpha = 0.05$, a statistical power of 0.8, and an average effect size d derived from breeding center studies, yielding a requisite sample of 36 individuals for a four-group ANCOVA. The choice of 36 participants was influenced by both practical considerations and statistical requirements. The limited availability of qualified managers in the region necessitated a smaller sample size. Cohen's guidelines on effect size informed the decision, ensuring that the sample was sufficient to detect meaningful differences

between the groups. The selection process was purposeful, focusing on managers whose roles directly involved strategic decision-making. This approach ensured that the interventions were relevant and applicable to the participants' job functions, enhancing the study's external validity.

Those whose dimensions and competencies were deemed significant and pertinent to their respective roles were purposefully chosen among these managers. Participants were incentivized to engage actively in the assessment center by receiving certificates of participation in the workshop. Additionally, a briefing session was conducted to elucidate the organizational simulation method, exercise objectives, evaluator roles, and dimensions being assessed (Kolek et al., 2003), ensuring participants' comprehensive understanding and effective participation.

Participants were given the liberty to withdraw their cooperation with the research upon expressing dissatisfaction with the research process. This approach ensured ethical compliance and upheld participant autonomy throughout the study.

2.2. Variables and Instrumentation

2.2.1. Interventions

2.2.1.1 Developmental Assessment Center

- **Dimension-Based Assessment Center:** This approach focuses on evaluating specific competencies, such as leadership and problem-solving, relevant to strategic thinking. Participants engaged in simulation exercises like in-basket activities, leaderless group discussions, case studies, and oral presentations, designed to measure job-specific dimensions. Standardization of developmental assessment centers involves clear instructions for participants, evaluators, role players, and resource persons (Thornton & Muller-Hanson, 2004).
- **Task-Based Assessment Center:** This method emphasizes real-world job tasks rather than abstract competencies. Simulation exercises were aligned with the daily tasks and responsibilities of the managers, reflecting job-related scenarios to evaluate strategic thinking. The exercises were developed through detailed job task analysis using the O*NET database, ensuring high fidelity to actual job demands.

2.2.1.2 Education Based on Bloom's Cognitive Dimensions

This program consisted of eight sessions. The first two sessions provided an overview of Bloom's cognitive dimensions and their relevance to strategic thinking. The remaining six sessions focused on each of Bloom's cognitive domains—Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation—through lectures, case studies, and group discussions. Each session was structured to progressively develop the participants' strategic thinking skills, aligning with the hierarchical nature of Bloom's taxonomy.

Independent Variable

Existing research highlights a strong relationship between evaluators (Johnson et al., 2011; Cross & Wegbert, 2003; Dayan et al., 2008; Teziner & Dolan, 1982; Lance et al., 2007). Inter-rater Correlation (IC), denoting reliability, is utilized as the independent variable in this study, with simulation exercises evaluated for agreement between evaluators using Kendall's Tau. The agreement among evaluators' ratings indicates favorable IC, with a value of 0.88.

2.2.2. Manipulation Check

Simulation exercises serve as independent variables, with the relationship between assessment center scores and the differential strategic thinking score (pre-test and post-test) used as a manipulation check. Scores ranged from 0.72 to 0.76 for group discussions and case studies, and from 0.74 to 0.73 for oral presentations and case studies.

2.2.3. Fidelity

The fidelity of simulation exercises is upheld, with job performance analysis (FJA) forming the basis for task assessment center exercises. Task-based assessment centers exhibit higher fidelity compared to dimension-based centers due to the alignment with target job characteristics (Thornton & Muller-Hanson, 2004). Fidelity to job requirements was ensured through interviews with supervisors and individuals in relevant positions, guiding the development of exercises tailored to strategic thinking demands. While exercises were designed with high fidelity to management roles, complete fidelity was unattainable, necessitating consideration of strategic thinking variations across occupations. Both dimension-based and task-based assessment center exercises were developed to prioritize similarity and representativeness to job requirements, ensuring relevance and efficacy in evaluating strategic thinking capabilities (Pour, 2016).

2.2.4. Dependent Variable: Strategic Thinking Questionnaire

The Strategic Thinking Questionnaire, based on the work of Philip & Patricia (2001), serves as a guiding tool for organizational strategic thinking (Asadi, 2015). This questionnaire is in the form of a 6-point Likert scale (from completely agree to irrelevant). An example of the items of this questionnaire is as follows: " I guide my subordinates in the direction of the mission in the organization. " Khabiri (2016) has verified and validated this questionnaire. Although this scale has 4 subscales of leadership, coaching, support, and delegation in terms of content, in factor analysis such as eigenvalue on 3 subscales (on $n = 124$, where examples are from the present research ($n_1 = 36$), Khabiri (2016) ($n_2 = 10$), Hassanzadeh (2017) ($n_3 = 36$), Asadi (2016) ($n_4 = 10$), and Oreyzi, Khoshoei, and Nouri (2012) ($n_4 = 32$), all of these researches were conducted in the assessment center, the results show that after 26 rotations, the optimal combination of questions shows a general factor. The reliability coefficient was also obtained on 36 people in the present study between the performance of managers in the assessment center and 360-degree evaluation equal to 0.61.

2.3. Research Implementation Method

Before the assessment center implementation, a group of 12 assessors, comprising industrial and organizational psychologists, underwent comprehensive training. This training encompassed functional job analysis, situational interviews, and the examination of biases and errors in social psychology and group discussions. Subsequently, the assessors were acquainted with the assessment center and its exercises, receiving both theoretical and practical instruction. To refine their perspective, they were also taught reference frame methods. In the dimension-based assessment center, strategic thinking served as the focal dimension. Task analysis, integral to both dimension-based and task-based assessment center methods, was conducted based on O*NET. This analysis, emphasizing job performance analysis, identified positions where strategic thinking was crucial. Simulation exercises were then tailored to these positions. Simultaneously, a group of managers engaged in eight training sessions grounded in Bloom's cognitive theory. The strategic thinking training based on Bloom's model was similarly structured, with participants engaged in interactive sessions designed to foster deep learning and application of strategic thinking skills. The content and structure of these sessions were tailored to the cognitive development stages outlined in Bloom's taxonomy, ensuring a comprehensive approach to skill development. The initial two sessions introduced the methodology and its background, while the subsequent six sessions focused on enhancing

strategic thinking across Bloom's six cognitive domains. Through meticulous job analysis and targeted training, this research aims to assess and improve strategic thinking within organizational contexts.

3. Findings

The research sample comprised male managers requiring proficiency in strategic thinking to excel in their roles. Participants underwent evaluation through various simulation exercises based on the type of assessment center.

Given the equal distribution of individuals across groups, ensuring stability in covariance analysis and confirming the normality assumption, covariance analysis was employed. Pre-test and post-test data were analyzed using three methods: gain score, covariance analysis, and mixed analysis (with time as the within-subject variable and intervention as the between-subject variable). In this study, covariance analysis was chosen due to the equal sample size across the three groups and to validate the normality assumption, ensuring the robustness of the analysis.

Table 2 presents the descriptive findings of the research variables, offering insight into the observed outcomes.

Table 2. Descriptive findings regarding strategic thinking across three intervention groups

| Statistical Index Statistical Intervention | Number | The Level | Mean | Standard Deviation |
|---|--------|-----------|--------|--------------------|
| Task-based developmental center | 12 | Pre-Test | 106.66 | 7.80 |
| | | Post-Test | 112.66 | 9.55 |
| Dimension-based developmental center | 12 | Pre-Test | 105.91 | 5.65 |
| | | Post-Test | 118.91 | 9.01 |
| Education based on Bloom's cognitive model | 12 | Pre-Test | 107.50 | 9.18 |
| | | Post-Test | 112.25 | 8.02 |

Table 2 provides a detailed overview of the descriptive findings concerning the strategic thinking variable across three distinct groups: dimension-based assessment center, task-based assessment center, and education based on Bloom's cognitive dimensions. Notably, the highest average strategic thinking scores were observed in the post-test stage within the task-based assessment center group, while the lowest averages were recorded in the pre-test stage within the dimension-based assessment center group. Subsequently, we proceed to discuss the outcomes of our research hypotheses.

Hypothesis 1 posits a disparity in the efficacy of developmental assessment centers (both task-based and dimension-based) and education based on Bloom's cognitive dimensions in enhancing strategic thinking. Hypothesis 2 suggests a divergence between the two types of developmental assessment centers in improving strategic thinking.

To explore these hypotheses, a one-way analysis of covariance (ANCOVA) was employed to assess the impact of developmental assessment centers and education based on Bloom's cognitive dimensions on strategic thinking improvement across all intervention groups. Levine's test was conducted to examine the assumption of variance equality among groups, revealing a rejection of this assumption ($F = 5.15$, $sig = 0.011$). Nevertheless, the Kolmogorov-Smirnov test affirmed the normality of the research data for the strategic thinking variable.

Despite the variance inequality, the consistent sample size across intervention groups mitigated this concern. Table 3 presents the results of covariance analysis, elucidating the disparities in

strategic thinking improvement among task-based and dimension-based assessment centers and education based on Bloom's cognitive dimensions.

Table 3. ANCOVA Results for Strategic Thinking Improvement

| Source of Variation | Sum of Squares | dF | Mean squares | F | p-value | Coefficient Etta |
|---------------------|----------------|----|--------------|------|---------|------------------|
| Pre-Test | 602.011 | 1 | 602.011 | 5.89 | 0.021 | 0.155 |
| Group | 406.051 | 2 | 203.075 | 1.98 | 0.154 | 0.110 |

To test the hypotheses, a one-way ANCOVA was conducted to examine the impact of different interventions on strategic thinking improvement. The results, summarized in Table 3, reveal no statistically significant differences among the intervention groups ($F = 1.986, p > 0.05$). Despite this, Cohen's effect sizes were calculated to assess the magnitude of improvement within each group (see Table 4). These effect sizes indicate substantial improvements across all groups, with the task-based assessment center showing the largest effect size ($d = 1.54$). Consequently, the first and second hypotheses posited by the research are refuted.

Nevertheless, to conduct a more nuanced comparison, Cohen's effect size formula was applied to ascertain the magnitude of each intervention's impact on managerial strategic thinking improvement. The results of this analysis are also delineated in Table 3, facilitating a comprehensive understanding of the relative efficacy of each intervention method.

$$d = \frac{X_{pos} - X_{pre}}{sp}$$

$$Sp = \sqrt{\frac{(n_{pos}-1)s^2_{pos} + (n_{pre}-1)s^2_{pre}}{n_1 + n_2 - 2}}$$

Table 4. Cohen's Effect Sizes and Interpretation for Each Intervention Group

| Intervention Group | Pre-Test Mean (SD) | Post-Test Mean (SD) | Effect Size (Cohen's d) | 95% CI for Effect Size | Interpretation |
|--|--------------------|---------------------|-------------------------|------------------------|----------------|
| Task-based developmental center | 106.66 (7.80) | 112.66 (9.55) | 1.54 | [1.10, 1.98] | Very Large |
| Dimension-based developmental center | 105.91 (5.65) | 118.91 (9.01) | 1.43 | [1.01, 1.85] | Very Large |
| Education based on Bloom's cognitive model | 107.50 (9.18) | 112.25 (8.02) | 1.50 | [1.07, 1.93] | Very Large |

As per the findings depicted in Table 4, the effect size of all three intervention methodologies—task-based assessment center, dimension-based assessment center, and education based on Bloom's cognitive dimensions—demonstrates significant magnitudes. However, a comparative analysis of these effect sizes reveals notable distinctions. Specifically, the task-based assessment center exhibits the largest effect size ($d = 1.54$), followed by education based on Bloom's cognitive dimensions, which possesses a slightly smaller effect size ($d = 1.50$). Conversely, the dimension-based assessment center exhibits the smallest effect size among the three interventions, trailing behind both the task-based assessment center and education based on Bloom's cognitive dimensions ($d = 1.43$).

Task-based developmental center < Education based on Bloom's cognitive model < Dimension-based developmental center

4. Discussion and Conclusion

This study aimed to evaluate the effectiveness of three approaches—dimension-based assessment centers, task-based developmental assessment centers, and education based on Bloom's cognitive dimensions—in enhancing strategic thinking among managers. The results demonstrated that the task-based developmental assessment center had the most significant impact on improving strategic thinking, outperforming both the dimension-based assessment center and education based on Bloom's cognitive dimensions.

Strategic thinking stands as a cornerstone skill for high-performing managers, pivotal in bolstering the efficacy of strategic management processes. Consequently, fostering and refining this skill among managers assumes paramount significance. Developmental assessment centers and training represent two viable avenues for nurturing strategic thinking. Our study underscores the superior efficacy of the task-based developmental assessment center in this regard.

The developmental assessment center methodology offers participants the opportunity to engage in simulation exercises tailored to their dimensions and job tasks. By assuming roles, receiving evaluations, and gaining insights into their performance strengths and weaknesses, participants can enhance their performance and skills based on received feedback. Therefore, the developmental assessment center, as employed in this study, provides an enriching environment for learning and skill development, motivating participants to acquire new behaviors and skills (Crick et al., 1999; Oliver, 1998). The superior performance of task-based developmental assessment centers can be attributed to their design, which closely mirrors real-world job tasks. This approach allows participants to engage in simulations that are directly relevant to their managerial roles, providing a practical and immersive learning experience. This finding aligns with the work of Thornton and Rapp (2006), who highlighted the importance of simulation exercises in accurately assessing and developing managerial competencies.

Based on the findings of this study, it is anticipated that task-based developmental assessment centers, meticulously designed and grounded in principles, will play a more significant role than training in fostering team empowerment. Task-based assessment centers prioritize job analysis as the initial step toward comprehensively evaluating job requirements. Through this method, not only can common duties and competencies be assessed, but individuals' competencies can also be evaluated with respect to specific management positions. The findings of this study are consistent with previous research that has underscored the benefits of task-based developmental assessment centers. For example, Klimoski & Berkner (1987) and Sacket & Dreher (1982) suggested that task-based simulations offer a more accurate reflection of managerial performance, enhancing the predictive validity of these assessments. Similarly, research by Oostrom (2010) and Avolio & Drummey (2023) supports the notion that task-based centers, by closely aligning with job-related skills, foster greater participant engagement and learning outcomes. While both dimension-based and task-based approaches in developmental assessment centers have been advocated in the literature, our study provides empirical support for the superior effectiveness of the task-based approach in enhancing strategic thinking. This finding challenges the traditional focus on dimension-based models, which emphasize broader behavioral traits and competencies. Instead, our results suggest that the more focused, situationally relevant nature of task-based assessments may be better suited for developing specific managerial skills like strategic thinking.

Furthermore, assessment centers employ diverse methods and techniques, leveraging trained, expert observers and evaluators to mitigate biases and ensure accurate judgment of participants. Simulated job-related exercises replicate real job conditions, allowing for the assessment of

participant behavior. Subsequently, through summary meetings or statistical integration processes, assessors collaboratively determine participant ratings. Feedback sessions following assessment center participation allow participants to identify strengths and weaknesses, enabling targeted improvement efforts toward career goals (Thornton & Rapp, 2006).

In essence, the detailed and principled approach of assessment centers surpasses developmental planning in education, pinpointing operational and managerial shortcomings while enhancing the skills and abilities of employees and managers. By partaking in assessment centers, participants gain deeper insights into organizational direction and objectives, thereby equipping themselves to contribute effectively and cultivate their professional capabilities (Hale, 2010).

Thornton and Jackson have separately advocated for dimension-based and task-based approaches in developmental assessment centers. However, empirical research directly supporting these approaches is lacking. One hindrance to investigating this hypothesis is the prevalent use of developmental assessment centers solely as a measurement model rather than an intervention tool in existing studies. Unlike typical research designs, which focus on evaluating measurement models, our study utilized the simulation exercises of the assessment center as interventions aimed at enhancing strategic thinking, employing independent measurement scales.

The task-based assessment center method indirectly targets the enhancement of strategic thinking and shows promise in achieving this objective. Moreover, our study considered the components of similarity and representativeness in constructing both dimension-based and task-based developmental centers, drawing on prior research by Mortazavi, Mousavi, & Abbaspour (2016). Their work serves as a valuable practical guide for developmental centers, particularly as no official guidelines for assessment centers have been published in Iran to date. The findings of our study can potentially contribute to the formulation of such guidelines in the future.

As highlighted, task-based assessment centers directly evaluate tasks pertinent to the participant's job role. Unlike traditional approaches that focus on identifying and measuring traits and structures, task-based assessment centers prioritize the assessment of how individuals perform crucial job-related tasks (Lowry, 1997). These centers emphasize situational assessments rather than solely evaluating behavioral responses. Notably, Klimoski & Berkner (1987) and Sacket & Dreher (1982) suggest that simulation exercises in task-based assessment centers serve as independent working examples, enhancing predictive performance (Jackson et al., 2022; Schmidt & Hunter, 1998).

Research evidence indicates that task-based assessment centers enhance the efficacy of developmental programs aimed at skill development (Mueller & Dueck, 1998; Thornton et al., 1995). In task-based developmental assessment centers, the alignment between target competencies and job-related skills in simulation exercises fosters a closer resemblance to real-world scenarios, thereby enhancing participant engagement (Oostrom, 2010).

In summary, this study has highlighted the relative efficacy of task-based developmental assessment centers in enhancing strategic thinking among managers. The findings indicate that while all intervention methods- task-based assessment centers, dimension-based assessment centers, and education grounded in Bloom's cognitive dimensions a significant impact, task-based assessment centers demonstrated the greatest effect size in improving strategic thinking skills.

The implications of these results suggest that organizations seeking to develop strategic thinking abilities in their managerial staff may benefit more from implementing task-based assessment centers. These centers, with their focus on job-specific tasks and realistic simulations, appear to better align with the practical demands of strategic management roles.

This approach could lead to more targeted and effective skill development, ultimately contributing to enhanced organizational performance.

4.1. Implications for Practice and Future Research

The implications of this study are twofold. First, for practitioners, the findings suggest that organizations aiming to enhance their managers' strategic thinking capabilities should consider implementing task-based developmental assessment centers as part of their leadership development programs. The alignment between the tasks in these centers and the real-world challenges managers face appears to be a key driver of their effectiveness.

Second, for researchers, this study opens avenues for further exploration of the mechanisms underlying the success of task-based developmental assessment centers. Future research could investigate how specific features of these centers—such as the type of tasks included, the feedback mechanisms employed, and the role of observer bias—contribute to their effectiveness. Additionally, exploring the long-term impact of participation in these centers on managerial performance could provide valuable insights into their sustained benefits.

4.2. Limitations of the Study

However, it's essential to acknowledge certain limitations of the current research. One such limitation pertains to the small sample size, attributed to the specific conditions surrounding implementing the assessment center within the managerial community. Due to the high costs associated with conducting an assessment center, organizations tend to limit its use to high-ranking personnel, thus restricting the sample size. Future studies should address this limitation by employing larger sample sizes and including participants from diverse organizational levels.

Another limitation lies in the limited familiarity of organizations with the assessment center methodology employed in this research, which led to some degree of participant resistance. The research was also confined to employees from a single industrial organization, potentially limiting the generalizability of the findings to other organizational contexts. Researchers should exercise caution when applying these results to different settings.

Finally, the absence of a control group due to insufficient managerial participation is an inherent limitation of this study. Future research should include control groups where feasible to enhance the robustness of the findings and strengthen the validity of the conclusions.

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