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Journal of Social Studies Education Research
Sosyal Bilgiler Eğitimi Araştırmaları Dergisi

2024:15 (3), 146-172

Examining Leadership Competencies of First-Year Undergraduates: The Mediation and Moderation Effects of Gender and Academic Disciplines

Mohammed S. Alkathiri [1], Nasser S. Alrayes [2] & Ahmed R. Khatiry [3]

Abstract

This investigation aims to measure the leadership skills level among Saudi undergraduates. It addresses measuring four main skills as indicators for leadership competencies: communication and personal behavior, learning and reasoning, strategic planning and civic responsibility, and self-awareness and interpersonal interaction. The study endeavors to assess the leadership capabilities of first-year college students at a Saudi university through an examination of various skills. While also investigating two mediation effects of these skills and two moderating impacts of gender and academic discipline. We perform structural equation modeling on a dataset comprising 5,992 responses collected from surveyed students. The key findings indicate a high level of leadership skills among first-year Saudi undergraduate students. The study provides support for the mediating effects of personal attributes, such as communication, personal behavior, self-awareness, and interpersonal interaction, on other leadership skills. The moderating role of study type has been supported in the relationship between learning and reasoning skills and strategic planning and civic responsibility. However, the controlling role of gender has been rejected. Research emphasizes integrating leadership skills in undergraduate education, addressing demographic factors. Insights guide policymakers to support social studies students and low achievers through systematic educational methods and tailored programs for faculty-student engagement.

Keywords: *First-year students. higher education, leadership skills, undergraduates' competencies*

Introduction

The development of students' leadership competencies stands as a cornerstone in higher education systems, representing an important outcome of academic endeavors. This critical emphasis arises from the profound impact graduate leaders can exert on societal progress and professional

[1] *Assoc. Prof., Teaching and Learning, Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia; Email: msalkathiri@iau.edu.sa*

[2] *Assoc. Prof., Educational Administration, Department of Self-Development, Deanship of Preparatory Year and Supporting Studies, Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia; Email: nsalrayes@iau.edu.sa*

[3] *Assoc. Prof., Educational Foundations, Educational Studies Department, Rustaq College of Education, University of Technology and Applied Sciences, Sultanate of Oman; Foundations of Education Department, Faculty of Education, Fayoum University, Egypt; Emails: ahmedkhatiry@fayoum.edu.eg & ahmed.khatiry@utas.edu.om (Corresponding Author)*

evolution. Consequently, the efficacy of higher education institutions in nurturing these competencies is paramount, as they play a pivotal role in shaping individuals who will effectively contribute to and shape their society and fields. In recent decades, there has been a global proliferation of leadership development initiatives aimed at university students (Skalicky et al., 2018). Recognizing the universal significance of leadership skills across academic disciplines, higher education institutions have increasingly emphasized the need to equip students with these competencies to meet the demands of their future careers (Seemiller & Murray, 2013). However, the efforts of institutions in this regard exhibit variability, particularly in the collection and analysis of pertinent data relevant to students' leadership competencies. This variability encompasses the identification of existing competencies, areas requiring improvement, and the recognition of students likely to excel in leadership during their academic tenure.

The extensive range of leadership competencies emphasized in undergraduate leadership programs is notable, as elucidated by Seemiller (2013). The creation of such programs offers manifold benefits, affording students the opportunity to develop transferable skills highly prized by employers, thereby enhancing their career prospects (Peck, 2018). Prioritizing the assessment of students' leadership competencies and crafting programs tailored to their enhancement is paramount, aligning with observed outcomes. This approach is indispensable in nurturing success across both academic and professional domains for students.

Similarly, in the process of hiring new staff, employers often prioritize a diverse array of skills essential for various job roles, which can be acquired and developed through training (Alrayes et al., 2021). However, UNESCO observes that many Arab universities primarily function as teaching institutions and may not adequately equip students with the specific skills demanded by the labor market (UNESCO, 2018, p. 16). Furthermore, there is a dearth of studies exploring students' perspectives on the relevant competencies and abilities essential for their leadership development (Richards, 2012). The lack of clear conceptual frameworks and pedagogical approaches raises concerns about the effectiveness of these programs in instilling the graduate capabilities increasingly sought after by employers (Skalicky et al., 2018). This potential gap may manifest in challenges faced by faculty members in fostering students' leadership competencies for future success. Enhancing the teaching effectiveness of faculty members is crucial, given their considerable impact on students' educational experiences (Alkathiri, 2020; Cott & Scott, 2016).

Hence, the primary emphasis of higher education institutions lies in crafting a model of leadership competencies tailored to the academic environment by leadership through fellowship (Beckmann, 2017). This endeavor encompasses involves more than just assessing students' leadership qualities, but also incorporating them into structures aimed at achieving curriculum goals and academic programs by explicitly including knowledge and evidence related to the leadership of teaching (Quinlan, 2014). The current study examines leadership skills among first-year undergraduates in a public university in the Eastern Region of Saudi Arabia. Furthermore, it investigates the mediating effects among four key competencies: learning and reasoning, self-awareness and interpersonal interaction, communication and personal behavior, and strategic planning and civic responsibility. Additionally, the study examines the moderating effects of gender and field of study on the relationships between these leadership competencies.

This study's rationale lies in understanding the crucial importance of leadership skills in higher education, especially for first-year undergraduates, as they prepare for future leadership positions. By inspecting the role of key competencies in mediation, the study aimed to provide a constructive perception of the complex process of leadership development in academic settings. By filling this gap in the research, it augments the knowledge of leadership dynamics, guiding specific strategies for developing leaders that consider the various settings and experiences of students.

Theoretical and Conceptual Framework

The philosophical foundation of this study is firmly grounded in the critical realism approach. Critical realism posits that reality exists independently of human subjectivity, emphasizing its existence regardless of observation or experience. This perspective distinguishes between objective reality and subjective experience, recognizing that empirical phenomena are only accessible through human perceptions, inferences, and comprehension (Alkathiri & Olson, 2019; Cruickshank, 2007). Unlike positivism, which seeks to establish generalisable laws, and interpretivism, which focuses on understanding the lived experiences or beliefs of social actors, critical realism, as articulated by McEvoy and Richards (2006), pursues a distinct research objective. Rather than striving for generalizable laws or exploring subjective experiences, the primary aim is to achieve deeper levels of explanation and comprehension. In the context of this study, which endeavors to refine the definition and understanding of competencies influencing the

leadership learning and development of first-year university students, a focused examination of four specific leadership competencies in these students was conducted.

Leadership Competencies

The concept of competence lacks a globally agreed-upon definition, despite its longstanding presence in education and training. Initially, competence was narrowly construed as an individual's performance capabilities, yet it has since evolved into a more comprehensive perspective. This broader understanding assesses the possession and development of a combination of skills, knowledge, behaviors, and integrated values within the context of work performance (Bourgonje & Tromp, 2011, p. 9). According to International Labor Organization (2020) competence is defined as the observable ability to successfully apply knowledge, skills, and behaviors in accomplishing work activities at a specific performance level expected in a realistic work environment (p. 10). Seemiller (2013) characterizes leadership competencies as the amalgamation of knowledge, values, abilities, and behaviors that enable an individual to contribute successfully to a job or task.

Likewise, Hallenbeck (2016) and Centre for Creative Leadership (CCL) emphasized that every leader, regardless of their position, should possess proficiency in essential leadership skills. These encompass self-awareness, the ability to understand oneself and one's contributions; learning agility, the capacity to recognize, process, and swiftly apply new information to address emerging challenges decisively; communication, the ability to establish shared understanding and articulate a vision for the future; and influence, the capability to persuade others to align with that vision. It's noteworthy that each of these core skills encompasses various sub-skills (Hallenbeck, 2016). However, a sole focus on monitoring students' leadership competencies and designing programs for their development might overlook the holistic nature of leadership, which is affected by external factors and diverse environments. Indeed, leadership is influenced by various external factors and diverse environments. A competency-based approach, inherently centred on the leader, may not fully address the complexity of the leadership process. It reflects the naturally leader-centric (Seemiller, 2016). Nevertheless, this approach aligns with the trend towards achieving an acceptable level of student leadership performance, preparing them to navigate various situations and challenges in the future.

In the present study, learning and reasoning skills have been reflected as a metric to assess students' capacity to acquire knowledge, skills, and values, as well as their ability to discern facts through reflective processes (Flores et al., 2012). Self-awareness and interpersonal interaction assess the extent to which students possess the requisite skills, knowledge, and values for self-understanding and an awareness of the motivations guiding interpersonal interactions (Ashley & Reiter-Palmon 2012). Additionally, communication and personal behavior evaluate students' ability to effectively communicate with others and authentically express personal feelings and behavior. Lastly, strategic planning and civic responsibility measure students' proficiency in planning for the future and taking responsibility for the consequences of their decisions and choices.

Leadership competencies and 21st-century education

Given the escalating global changes and societal challenges, there is an urgent demand for leadership within the academic sphere, commonly referred to as academic leadership. This form of leadership not only impacts the survival and advancement of universities but also contributes considerably to the development of students' leadership competencies, thereby enhancing their employment prospects. Despite existing gaps in academic leadership research (Croucher et al., 2020), it plays a pivotal role in 'enhancing the overall performance of universities. The complexities inherent in academic leadership across diverse contexts, coupled with challenges such as heavy academic workloads and a lack of preparation in academic leadership, render research in this field both exploratory and context-dependent (Dinh et al., 2021; Evans, 2017; Lakomski & Evers, 2022).

Leadership competency is typically cultivated through practice, developed within students' educational experiences and the challenges they encounter. To ensure successful development, it's crucial to identify specific leadership competencies and align them with the educational outcomes of courses and academic programs. This alignment enables measurement as part of the teaching and learning process, as leadership competency is acquired through a learning journey that requires attention to the student as a whole person (Gott et al., 2019). For academic programs to succeed, they must be designed to attain specific educational outcomes that are both controllable and measurable. These outcomes should embody a clear philosophy of leadership education (Peck, 2018). The COVID-19 pandemic has ushered in rapid and sometimes unforeseen changes globally, reshaping the nature of current and future employment. Higher education must adapt to these shifts

to uphold its role in providing qualified employees for 21st-century jobs (Alkathiri, 2020). The preparation of students for the labor market necessitates a reassessment, with a greater emphasis on measuring 21st-century skills (Burrus et al., 2017). Leadership is recognized as one of the essential skills for the workforce of the 21st century (Whorton et al., 2017, p. 51). Drawing from the Student Leadership Competencies Model devised by Seemiller (2013), which comprises 60 competencies, each with four dimensions (knowledge, value, ability, and behavior), the authors selected four competencies: Learning and Reasoning, Self-awareness and Interpersonal Interaction, Communication and Personal Behavior, and Strategic Planning and Civic Responsibility. The authors propose that for a student to attain overall competency in leadership, integration of these four competencies must occur. Focusing on these skills helps students cultivate positive intellectual attitudes based on ethical values, guiding their individual and collective behavior, and promoting success in both current academic pursuits and future professional endeavors.

First-Year University Students

The first year in Saudi universities is designed to facilitate students' transition from secondary schooling to higher education. During this period, the focus is on acclimating to a new living and educational environment while employing teaching and learning methods that contribute to the development of 21st-century skills. However, there exists a need for Saudi universities to prioritize educational outcomes and adapt teaching and learning methods to align with 21st-century skills (Evidence for Policy Design, 2019). Establishing connections between graduates and the local labor market is paramount, underscoring the importance of preparing students for the workforce right from their first year. This emphasis enhances their skills, efficiency, and ability to meet the requirements of the labor market (Alrayes, 2022).

It is worth mentioning that it has been expanded the recognition of the critical significance of leadership abilities within the realm of higher education, along with the imperative to tailor these competencies to the unique academic environment (Amirianzadeh et. al, 2010; Mozhgan et al., 2011). Specifically focusing on first-year college students, the research aims to address a pivotal developmental stage wherein they are cultivating essential skills for future leadership roles. To address the existing gaps in the literature, the present study addresses a notable gap in the academic literature by offering insights into the intricate facets of leadership competencies among Arab

undergraduates. Through an exploration of mediation and moderation effects, the study contributes to a deeper understanding of how these competencies manifest and evolve within the higher education landscape, thereby informing endeavors to enhance leadership development initiatives. As such, this investigation addressed to answer the following questions:

- What is the impact of communication and personal behavior skills on the relationship between learning and reasoning, and strategic planning and civic responsibility?
- How do self-awareness and interpersonal interaction skills affect the relationship between learning and reasoning, and strategic planning and civic responsibility?
- Does gender and the field study moderate the relationship between learning and reasoning and strategic planning and civic responsibility?

Method

Research Design

The primary objective of this study is to examine the leadership competencies of first-year students, with a specific focus on Learning and Reasoning (hereafter referred to as L-R), Self-awareness and Interpersonal Interaction (hereafter referred to as SA-II), Communication and Personal Behavior (hereafter referred to as C-PB), and Strategic Planning and Civic Responsibility (hereafter referred to as SP-CR). The study underscores that achieving holistic leadership competency is best accomplished by integrating these competencies into students' behaviors. Each competency encompasses essential skills, knowledge, and values crucial for effective leadership. The study defines L-R as the acquisition of knowledge, skills, and values through reflection. SA-II refers to a student's understanding of themselves and their awareness of motivations guiding personal behavior. C-PB assesses a student's ability to communicate successfully and express personal feelings. SP-CR evaluates a student's skills in planning for the future, taking responsibility for decisions, and understanding consequences.

The customized approach adopted in this study aligns with core leadership skills, emphasizing their interconnectedness and drawing insights from Seemiller's model (2013) and the proposed "core leadership skills" outlined by the CCL (Hallenbeck, 2016). The authors have intentionally chosen a simplified conceptual framework to assess students' leadership competencies within the university setting, identifying shared elements among different competency models, including those of the CCL and Seemiller. This approach allows for a comprehensive yet manageable

analysis of students' leadership development within the context of higher education. Further, the study underscores that achieving holistic leadership competency is best accomplished by integrating these competencies into students' behaviors. Each competency encompasses essential skills, knowledge, and values crucial for effective leadership. The study defines L-R as the acquisition of knowledge, skills, and values through reflection. SA-II refers to a student's understanding of themselves and their awareness of motivations guiding personal behavior. C-PB assesses a student's ability to communicate successfully and express personal feelings. SP-CR evaluates a student's skills in planning for the future, taking responsibility for decisions, and understanding consequences.

As such, this comprehensive methodological approach enables an in-depth examination of the leadership competencies exhibited by first-year students in colleges, considering the moderating and mediating effects introduced by gender disparities and academic areas of study. It was achieved through the employment of Structural Equation Modeling (SEM) that enables the researchers to explore the complex interrelationships between a myriad of variables, including the influences of mediation and moderation (Dash & Paul, 2021; Kline, 2023). This methodology facilitates a simultaneous exploration of multiple factors and pathways, ultimately resulting in a comprehensive understanding of the interplay among gender differences, academic specializations, and leadership proficiencies.

Seemiller's (2013) model, stemming from a thorough examination of learning outcomes, delineates 61 competencies spanning eight categories, offering valuable insights into the skills necessary for future leadership roles. The deliberate emphasis on these competencies facilitates a focused assessment, thereby enriching the development of customized student leadership programs. The goal is to seamlessly integrate these competencies into academic programs, ensuring their practical application in real-world contexts. This approach aims to equip students with the multifaceted skills required to excel as leaders in diverse environments and scenarios. It adopts a comprehensive research design to explore the intricate dynamics of leadership competencies among first-year undergraduates. The primary objective is to unveil the relationships among key competencies L-R, SA-II, C-PB, and SP-CR, while also examining the mediating effects and moderating effects of gender, academic disciplines, expatriation, and study tracks. Figure 1 illustrates the envisioned model, integrating the structural framework of mediation and moderation effects among the study variables.

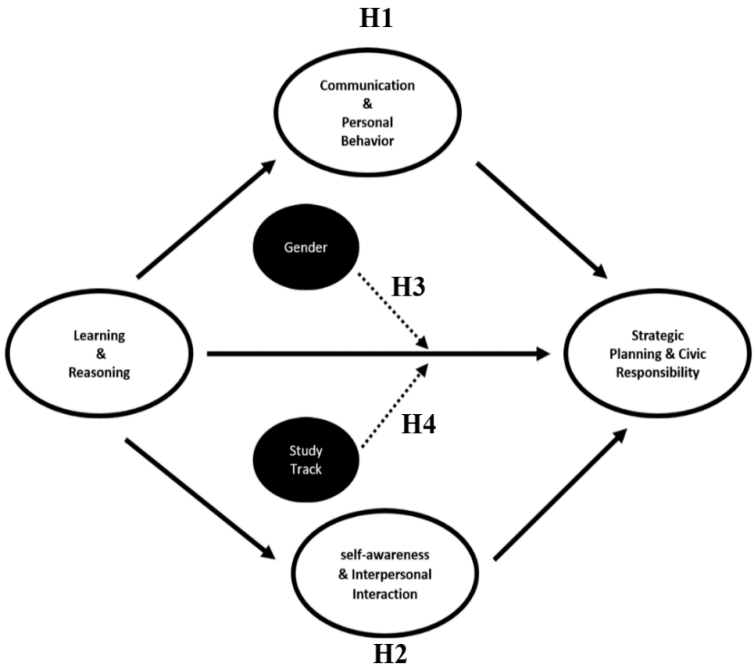

Figure 1. Structure model and study hypotheses

The study establishes four hypotheses to explore the bidirectional effect of the variables:

- Hypothesis 1: Communication and Personal Behaviour skills (C-PB) mediate the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).
- Hypothesis 2: Self-awareness and Interpersonal Interaction skills (SA-II) mediate the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).
- Hypothesis 3: Students' gender moderates the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).
- Hypothesis 4: Studying track of students moderates the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).

Sample

The study employed a convenience sample comprising first-year students from a public university in the Eastern Region of Saudi Arabia. An online survey was distributed to all first-year students, resulting in 5,992 participants completing the survey. The sample consisted of 76.6% female and

23.4% male participants. These participants were categorised into four main college cluster: health, engineering, sciences, and humanities. Table 1 shows of the statistics for respondents within each category.

Table 1

Respondent demographic data

Categories of participating heads of department		Overall sample count (n=5,992)	%
Gender	Male	1404	23.4
	Female	4588	76.6
College Cluster (University Study Field)	Health	872	14.6
	Engineering	570	9.5
	Sciences	2830	47.2
	Humanities	1720	28.7

Instrument

The study utilized an electronic questionnaire to assess participants' overall level of leadership and their specific proficiency in each competency. The questionnaire drew upon the Student Leadership Competencies Model (SLCM) outlined by Seemiller (2013), which comprises 60 competencies organized into eight overarching clusters, with each competency featuring four dimensions: knowledge, value, ability, and behavior. Consequently, a modified questionnaire was developed, focusing on four competencies of leadership. It included 27 items to measure students' competency levels from their individual perspectives, using a three-point scale: agree, neutral, disagree. Subsequently, principal components analysis (factor analysis) of the measurement items was conducted on a random sample of 1,000 students to validate the items overall and within each competency. Items scoring less than 0.50 were excluded. As depicted in Appendix 1, a specific number of items were adopted in each competency as follows: L-R (7 items), SP-CR (7 items), SA-II (7 items), and C-PB (6 items).

To ensure face validity, the questionnaire underwent evaluation by four faculty members specialized in education. This panel comprised three assistant professors and one associate professor, all possessing extensive experience in developing training and leadership programs for both students and faculty members. Additionally, they demonstrated a deep understanding of the academic context and had prior experience teaching first-year university students. Concerning the reliability of indicators, the study examined outer loadings, composite reliability (CR), and average

variance extracted (AVE) (Gannon et al., 2021; Hair et al., 2017). The measurement model underwent thorough analysis to confirm the reliability and validity of the constructs, with a specific focus on the outer loadings of questionnaire items related to each construct. Table 2 presents a detailed analysis of composite reliability and convergent validity for the study constructs L-R, SP-CR, SA-II, and C-PB.

Table2

Convergent Validity and Composite Reliability of study constructs

Construct	Convergent Validity				Cronbach's alpha	Composite Reliability		Average Variance Extracted (AVE)
	L-R	SA-II	SP-CR	C-PB		(rho_a)	(rho_c)	
Learning and Reasoning					0.946	0.952	0.957	0.760
L-R1	**0.974**	0.707	0.844	0.790				
L-R2	**0.839**	0.597	0.706	0.626				
L-R3	**0.919**	0.626	0.763	0.722				
L-R4	**0.758**	0.548	0.622	0.555				
L-R5	**0.886**	0.611	0.731	0.705				
L-R6	**0.835**	0.597	0.710	0.627				
L-R7	**0.873**	0.627	0.752	0.657				
Self-awareness and Interpersonal Interaction					0.785	0.767	0.821	0.624
SA-II 1	0.240	**0.645**	0.344	0.332				
SA-II 2	0.597	**0.613**	0.520	0.465				
SA-II 3	0.185	**0.605**	0.306	0.268				
SA-II 4	0.602	**0.718**	0.698	0.506				
SA-II 5	0.213	**0.617**	0.310	0.305				
SA-II 6	0.597	**0.648**	0.553	0.465				
SA-II 7	0.221	**0.557**	0.311	0.354				
Strategic Planning and Civic Responsibility					0.770	0.801	0.820	0.673
SP-CR1	0.291	0.429	**0.615**	0.308				
SP-CR2	0.742	0.675	**0.749**	0.584				
SP-CR3	0.221	0.329	**0.511**	0.246				
SP-CR4	0.714	0.515	**0.717**	0.556				
SP-CR5	0.207	0.327	**0.514**	0.254				
SP-CR6	0.393	0.583	**0.768**	0.629				
SP-CR7	0.287	0.388	**0.493**	0.337				
Communication and Personal Behavior					0.814	0.816	0.857	0.501
C-PB1	0.336	0.429	0.399	**0.735**				
C-PB2	0.660	0.488	0.560	**0.691**				
C-PB3	0.329	0.416	0.390	**0.727**				
C-PB4	0.561	0.384	0.463	**0.607**				
C-PB5	0.331	0.423	0.396	**0.723**				
C-PB6	0.657	0.546	0.655	**0.752**				

The presented indicators provide a comprehensive overview of the measurement properties of four key constructs. For L-R, high convergent validity is evident, with values ranging from 0.758 to 0.974, indicating consistent measurement. The overall reliability, assessed by Cronbach's alpha, is notably high at 0.952. Composite reliability is excellent, ranging from 0.706 to 0.844, highlighting the internal consistency of the construct. Moreover, the Average Variance Extracted (AVE) values, ranging from 0.626 to 0.790, indicate a satisfactory amount of variance captured by L-R. Regarding SA-II, moderate convergent validity is suggested, with values ranging from 0.185 to 0.602. Cronbach's alpha indicates good overall reliability, ranging from 0.767 to 0.767. Composite reliability is reasonable, ranging from 0.506 to 0.718, and AVE values fall within an acceptable range of 0.268 to 0.506, indicating satisfactory variance capture. Similar patterns are observed for SP-CR and C-PB, with indications of moderate convergent validity, good overall reliability, sound composite reliability, and satisfactory AVE values. In summary, the data underscores the robustness and internal consistency of the measurement models for each construct in the study.

Data collection

The extant data was initially acquired through the utilization of "Psychological Batteries" developed by the University Counselling Centre (UCC) of the sampled university. All admitted students undergo these assessments upon their enrolment at the university. These psychological measurements are designed to investigate students' interests, behaviours, skills, and personal aspects. The study tool was developed by performing factor analysis on the measurement items based on the initial modified tool, a random sample of 1000 students was utilized. A panel of four arbitrators examined the results of factor analysis to develop the study tools as presented in Appendix 1.

Data analysis

Given the study's objectives and hypotheses, a quantitative design was adopted. The evaluation of both measurement and structural models pertaining to leadership competencies was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). Smart PLS4 (Ali et al., 2018; Ringle et al., 2022) served as the analytical tool to analyse the mediation and moderation effects among students' skills. Furthermore, the reflective measurement models underwent an assessment of reliability and convergent validity.

Findings

The study findings provide a comprehensive understanding of leadership competencies among first-year undergraduates, highlighting the distinctiveness of constructs, proficiency levels, and the mediating and moderating roles of various competencies in shaping leadership development. Statistical analysis of leadership competencies revealed that each competency had a considerable relative weight, with harmonic mean variance (HMV) values and highly significant p-values, emphasizing their statistical significance. Regarding proficiency levels, 51.20% of the participants exhibited a high level of leadership competencies, 47.10% demonstrated an average level, and 1.70% displayed a low level. These findings provide quantitative insights into the distribution of leadership skill levels among first-year undergraduates, facilitating educational interventions and program enhancements.

Measurements Model Assessment

Collinearity statistics (VIF)

The collinearity statistics (VIF) for the inner model variables are reported in the table. Variance Inflation Factor (VIF) values are indicators of multicollinearity, where higher values suggest potential issues with collinearity among predictor leadership competencies. As shown in Table 3, the variables show relatively low VIF values, indicating a moderate level of independence among them.

Table 3

VIF of inner model

Inner Model	Collinearity statistics (VIF)
L-R -> C-PB	2.691
L-R -> SA-II	3.041
C-PB -> SP-CR	2.344
SA-II -> SP-CR	1.973

Discriminant validity

The study utilized the Heterotrait-Monotrait Ratio of Correlations (HTMT) to assess discriminant validity, which indicated that the constructs of leadership competencies among first-year undergraduate students were distinct and demonstrated sufficient distinctiveness. The HTMT values for all inter-construct comparisons were below the accepted threshold of 0.85, confirming

discriminant validity. In Table 4, The presented values indicate the constructs demonstrate sufficient distinctiveness, thereby confirming the discriminant validity of the selected leadership competencies. This reaffirms the assertion that these constructs represent distinct facets within the framework of first-year undergraduate students.

Table 4

Discriminant validity: Heterotrait-Monotrait Ratio of Correlations (HTMT)

	C-PB	L-R	SA-II	SP-CR
C-PB	**0.783**			
L-R	0.721	**0.845**		
SA-II	0.772	0.739	**0.822**	
SP-CR	0.017	0.088	0.052	**0.137**

Following the completion of data collection, the primary objective of the study was to ascertain the reality of leadership competencies within the sampled population. To achieve this, various statistical measures were computed, including arithmetic means, standard deviations, and the relative weights of the total degree for leadership competencies. These calculations were based on a hypothetical mean value equivalent to two-thirds of the maximum degree. This criterion was established considering the admission practices of the university where the study took place. Approximately 55,000 applicants submit applications, but only 6,000 students are admitted. Additionally, guided by Baxter Magolda's self-authorship theory, which posits that individuals typically do not attain self-authorship until the age of 30, the researchers anticipated that the average score for leadership competencies would not exceed two-thirds of the actual maximum score (Baxter Magolda, 2004).

Table 5 shows the statistical analysis of leadership competencies among first-year undergraduates, revealing specific numerical insights. Each competency demonstrates a considerable relative weight, ranging from 73.74% to 82.71%. The harmonic mean variance (HMV) values for each competency, ranging from 18 to 22, along with the highly significant p-values (0.0001), underscore the statistical significance of their impact on the overall leadership competencies. The overall level scores span from 52 to 123, with a mean of 97.90 and a standard deviation of 12.03, indicating the variability and central tendency of the collective competencies.

Table 5

Arithmetic mean, standard deviation, and relative weight of students' leadership competencies

Variable	Min.	Max.	Arithmetic mean	SD	Relative weight	HMV	*p*	SEM
C-PB	10.00	30.00	24.812	3.260	82.71%	20	0.0001	0.042
L-R	12.00	33.00	25.691	3.421	77.85%	22	0.0001	0,044
SP-CR	9.00	27.00	20.857	3.155	77.25%	18	0.0001	0,041
SA-II	13.00	33.00	26.548	3.439	73.74%	22	0.0001	0,044
Leadership Competencies (Overall)	52.00	123.00	97.908	12.03	77.71%	82	0.0001	0.155

N= 5992 SD=Standard Deviation SEM= Standard Error of Mean HMV= Hypothetical mean value

In line with the foregoing, the participants demonstrated elevated levels of overall leadership, as indicated by a mean score of 97.908 with a standard deviation of 12.03, $t(5992) = 102.3528$, $p = 0.0001$. However, when examining the distribution across three proficiency levels, responses from 5,992 participants revealed that 51.20% exhibited a high level of leadership competencies (placing within the top third of cumulative scores), 47.10% demonstrated an average level, and 1.70% displayed a low level. These numerical findings provide a quantitatively sound understanding of the leadership skill levels among first-year undergraduates, offering precise insights for educational interventions and the refinement of leadership development programs.

The Structural Model Assessment:

The structural model provides the results of hypothesis testing. Mediation analysis was conducted to assess the mediating role of surveyed students' behaviours, communication skills, self-awareness, and interpersonal interaction skills in the relationship between learning/reasoning skills and strategic planning/civic responsibility skills. Following are the research hypotheses that are investigated in this research:

- H1: Communication and Personal Behaviour skills (C-PB) mediate the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).
- H2: Self-awareness and Interpersonal Interaction skills (SA-II) mediate the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).

The results indicated a significant indirect effect of (L-R) on (SP-CR) through (C-PB) (H1: β= .070, t=8.535, p < .001). The total effect of (L-R) on (SP-CR) was also significant (β= .849, t=141.808, p < .001), and with the inclusion of the mediator (C-PB), the effect of (L-R) on (SP-CR) remained significant (β = 0.566, t = 42.915, p < .00). This shows a complementary partial mediating role of (C-PB) between (L-R) and (SP-CR), supporting H1 (See Table 6). The results revealed a significant indirect effect of (L-R) on (SP-CR) through (SA-II) (H2: β= .214, t=29.374, p < .001). Similarly, with consistent findings for total and direct effects, it suggests a complementary partial mediating role of (SA-II) between (L-R) and (SP-CR), supporting H2.

Table 6

The findings of mediation hypotheses

Total effects			Direct effect			Indirect effect			95% CI	
Coefficient	**t**	***P***	**Coefficient**	**t**	***P***	**Coefficient**	**t**	***P***	**Lower**	**Upper**
						H1: L-R → C-PB → SP-CR				
0.849	141.808	<0.001	0.566	42.915	<0.001	0.070	8.535	<0.001	0.054	0.086
						H2: L-R → SA-II → SP-CR				
						0.214	29.374	<0.001	0.003	0.026

- H3: Students' gender moderates the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).
- H4: Studying track of students moderates the relationship between Learning and Reasoning (L-R) and Strategic Planning and Civic Responsibility (SP-CR).

The result of the role of students' gender as a moderator of the relationship between (L-R) and (SP-CR) indicates no moderating effects of gender on the impact of learning and reasoning skills of students on their strategic planning and responsibility in society (Figure 2). It was found to have negative and insignificant indicators (H3: β=- 005, t=.342, SD=.015, p > 0.05). On the contrary, the moderating role of studying field/track reflects positive and significant effects (H4: β=0.061, t=10.344, SD=0.006, p < .001). Without the inclusion of moderating effects (L-R * Gender), the R-Sq value for (SP-CR) was 0.764. With the inclusion of the interaction term, the R-Sq increased to 0.787 by 2.3%, supporting H4.

Figure 2 illustrates the structure model by presenting the study indicators and findings of the study hypotheses. The measured model reflects that C-PB demonstrated a partially additive mediation

role, supported by a significant indirect effect of 0.070. Similarly, the SA-II showed comparable improvement with an indirect effect of 0.214. The examination of moderation showed that the gender of the students had no significant moderating effect on the relationship. In contrast, student education style moderated and magnified this relationship, resulting in a 2.3% increase in explained variance in SP-CR. These results highlight the importance of core competencies in emphasizing the mediation of the relationship between academic and theoretical abilities and strategic planning/civic responsibility.

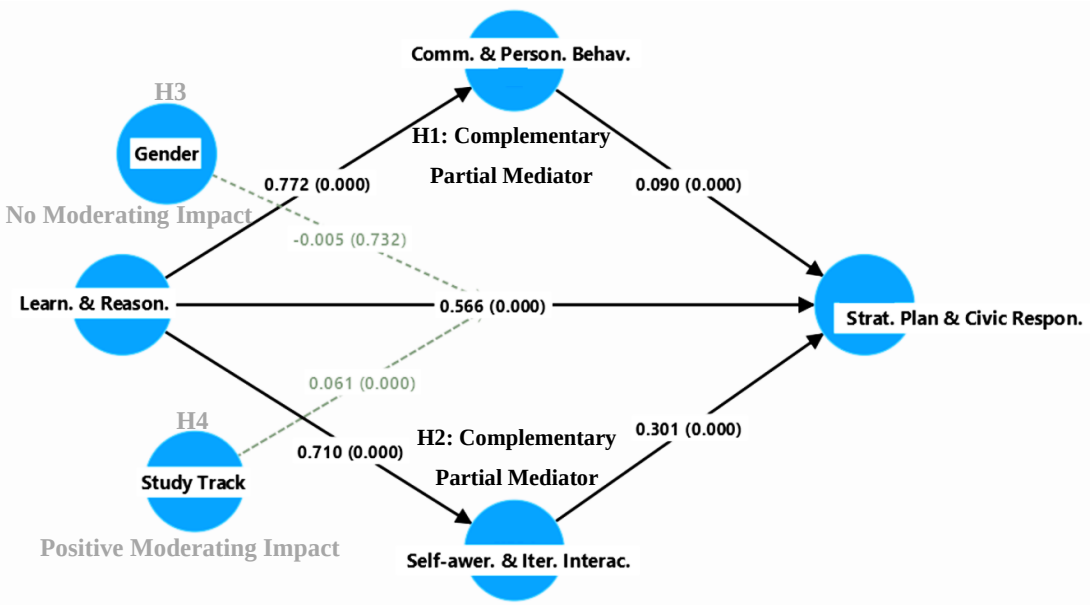

Figure 2. Findings of Structure model and study hypotheses

Discussion

The current study was conducted at a Saudi public university in the Eastern Province region, focusing on the assessment of leadership competencies among first-year students. The findings revealed a high level of leadership competencies among the participating students in all measured areas, including learning and reasoning, self-awareness and interpersonal interaction, communication and personal behaviour, and strategic planning and civil responsibility. From an interpretive perspective, the university where the study took place maintains a stringent admission process, with only a 12% acceptance rate. Out of 50,000 applicants, only 6,000 were accepted. Specifically, admission to Saudi higher education institutions hinges upon a student's successful

completion of secondary school and achievement in nationally standardised assessments, such as the general aptitude test and the standardised academic achievement test. Administered by the National Centre for Assessment at the Education and Training Evaluation Commission, these tests are mandatory for all secondary school students aspiring for higher education and play a crucial role in determining admission eligibility. By requiring proficiency in these assessments, universities ensure that admitted students possess the requisite knowledge and skills to excel in their academic programmes.

The results indicate that the majority of surveyed students possess leadership competencies across all four dimensions identified in this study. Particularly noteworthy is the students' reported proficiency in communication skills, which emerged as the highest indicator of leadership skills. This finding is consistent with recent research conducted in another Saudi university. The emphasis on communication skills aligns with previous research in Saudi universities, highlighting the importance of developing students' abilities in this area. Likewise, Albeladi (2020) explored various leadership skills, including planning, communication, teamwork, problem-solving, and decision-making. Additionally, the integration of strategic planning skills with civic responsibility underscores the students' role in society and decision-making processes. The approach of monitoring and enhancing students' leadership competencies aligns with the broader goal of preparing students to effectively navigate future challenges and situations.

Exploring the mediating roles of leadership skills in Arab undergraduate students

The study concluded that students' activities significantly contribute to enhancing communication skills among undergraduates. Additionally, Altammam (2019) identified an advanced level of decision-making skills among Saudi university students, correlating them with organisational citizenship behaviour. This correlation aligns with the present research findings, which integrate strategic planning skills with students' responsibility in their society as a unified dimension of leadership skills. The current findings also shed light on the extent of strategic planning skills among students, encompassing decision-making and problem-solving. They reveal a lower proficiency in strategic planning skills compared to communication, personal behaviour, learning, and reasoning skills. This aligns partially with Albeladi's (2020) investigation, which identified problem-solving and decision-making skills as the least developed leadership competencies among

Saudi students. However, Al-mehsin (2017) reported a remarkable level of decision-making skills among students from a Saudi university, contradicting this finding.

Previous investigations have primarily focused on assessing the extent of leadership skills among students. To address this gap in the Arab context, the current investigation examined the causal effects between two dimensions of students' leadership skills: learning and reasoning skills on one hand, and strategic planning and civic responsibility on the other. The study's hypotheses regarding mediating effects have been supported by the study findings, which posit causal relationships between students' proficiency in positive communication and interpersonal interaction, self-awareness skills, and their attitude towards others, affecting the relationship between learning-based reasoning and the development of their strategic planning and civic responsibility skills.

These results suggest that undergraduates who demonstrate proficiency in effective communication generally possess positive attitudes towards others. Moreover, these positive interactions appear to play a significant role in exerting a sustained impact on their behaviour and subsequent acquisition of essential leadership skills in their society. These observations are aligned with conclusions from earlier research studies (Sabanci et al., 2016; Shokri et al., 2014) and offer valuable insights for higher education institutions to enhance students' competencies by prioritising positive interactions within academic university settings. Moreover, these connections should be reflected in the developmental vision for academic curricula and in increasing attention to the quality of teaching and learning practices adopted by faculty members in this direction (Alkathiri, 2020; Muammar & Alkahtiri, 2022). Likewise, Abderrahim (2008) concluded that classroom interaction skills enable undergraduate students to enhance their communicative social leadership skills. As such, the promotion of students' interpersonal competencies as social leaders, is required to manage successful communication across multiple cultures and roles in interactions and situations.

Gender and field of study as mediators of leadership skill development

The results regarding the role of gender and studying field as mediators of the impact of learning-based reasoning on students' skills in planning and social responsibility align with certain earlier studies (Albeladi, 2020; Alzahrani et al., 2021), which asserted that medical and applied sciences students exhibit a higher level of leadership skills compared to their counterparts in other disciplines, including humanities and social sciences. These findings can be interpreted within the

Arab context, where the level of academic achievement in medical and applied sciences is typically higher than in other academic disciplines (Alhujaylan, 2014). In numerous preceding research undertakings conducted across diverse settings and contexts, a consensus has emerged suggesting that medical students consistently demonstrate a remarkable level of proficiency and expertise in the domain of leadership skills (Jorge et al., 2014; Lisevick et al., 2023; Nelliyanil et al., 2020)

Contrary to the study hypothesis, the results indicate that there is no significant controlling influence of gender on students' leadership indicators namely, the impact of reasoning skills on social efforts and responsibility skills. Within the cultural context of an Islamic community, the findings of the present research mirror those of a cultural inquiry conducted by Supriyadi et al. (2019). Their findings underscored the importance of reevaluating the notion of female leadership, challenging traditional perspectives while acknowledging the innate leadership capabilities of women. Additionally, there is a dearth of compelling evidence to refute the competence of women in leadership roles. Hence, it is evident that Islam does not impose strict limitations on the leadership roles of women in various spheres. From an interpretive standpoint, considering the indicators outlined in Saudi Vision 2030, there is a notable and rapid increase in the empowerment of women in social engagement (Alessa et al., 2022; Omair et al., 2020).

Ultimately, it has been underscored by Nair and Fahimirad (2019) that the significant contribution of life skills programs within university curricula towards the cultivation of students' essential life competencies. Such integration not only nurtures students' academic performance but also fosters the enhancement of crucial interpersonal proficiencies, including teamwork, effective communication, leadership acumen, adept time management, astute decision-making abilities, and adept problem-solving skills. Likewise, the present study provides valuable insights for policymakers and higher education institutions to enhance students' leadership competencies, emphasizing the importance of communication, strategic planning, and positive interactions in shaping future leaders.

Conclusion

This investigation considered the importance of developing leadership competencies among university students, particularly first-year undergraduates at a Saudi university. The study emphasises the importance of paying detailed attention to how leadership skills among

undergraduates are integrated and the effects of certain demographic factors, such as the type of study and gender. It addressed key skills that indicate leadership competencies and highlighted the significance of integrating these skills into the educational process. It is concluded that the development of student leadership competencies is crucial for universities as it contributes to enhancing the quality and efficiency of academic outputs, thereby bolstering the credibility and reputation of universities among stakeholders, employers, and society at large. Further, the interconnectedness between leadership competencies and 21st-century skills, as well as success in academic and practical life, cannot be overlooked. This approach aligns with the trend towards achieving an acceptable level of student leadership performance, equipping them to navigate different situations and challenges in the future.

The study investigated the need to address demographic factors such as gender and academic disciplines in leadership development. Furthermore, it suggested that enhancing the capacity of faculty members to engage with students showing leadership potential is essential. It also recommends implementing targeted guidance and enrichment initiatives to improve identified competencies. The most encouraging finding of this study is that the level of leadership competencies among Arab students was generally convincing, providing a solid foundation for interest in the quality of teaching and learning processes. However, achieving these goals requires a clear and scientific educational methodology that guides the processes of monitoring students' leadership competencies and then working on their development. As such, a longitudinal study on leadership development can be implemented as a future study to track the progression of leadership competencies among Arab students over their academic life. Moreover, it is suggested to conduct qualitative research to explore the experiences and perceptions of students in improving leadership competencies and providing insights into the effectiveness of such academic programs. The current study conclusions can be utilized by higher education policymakers to support social studies students and low achievers in enhancing their leadership skills. In this context, a future study can be conducted to examine the extent to which higher education institutions have supported initiatives aimed at encouraging leadership development among Arab students and identify areas for program refinement or expansion.

These findings, while important, must be considered within the context of some limitations such as the restricted sample size for first-year students and geographical focus at one Saudi university. While the study focused on a specific group of students in a particular region, the insights gained

can be valuable for higher education policymakers aiming to support students in developing their leadership capabilities in different settings. Moreover, the present study addressed monitoring students' leadership competencies by self-reported which could be considered a risk of overlooking the practical nature of leadership. The potential drawback of this is focusing theoretically solely on monitoring students' leadership competencies. To address this existing gap, a mixed-methods approach can be adopted in future studies that combine self-reported assessments with objective measures, such as performance in real-world leadership scenarios. This would offer a more comprehensive understanding of students' leadership abilities. Additionally, cross-cultural investigations can be suggested as future studies to explore how cultural factors influence the development and expression of leadership competencies among undergraduate students. Comparing different cultural contexts could reveal unique challenges and effective strategies for cultivating leadership skills.

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Appendix 1

Leadership Competencies Scale Items

Learning and Reasoning (L-R)	
L-R1	I find it difficult to understand some of the subjects
L-R2	I am worried about overload in studying university courses.
L-R3	I am satisfied with the academic specialty (study track) I have joined
L-R4	I enjoy while doing my homework
L-R5	I usually look on the bright side of things
L-R6	When interacting with my colleagues, I strive to win every argument, regardless of what is right or wrong
L-R7	I can extract the main idea of the lesson and focus on conclusions and applications
Strategic Planning and Civic Responsibility (SP-CR).	
SP-CR1	I find it difficult to organize study times
SP-CR2	I am hesitant to make my decision
SP-CR3	I have trouble managing my finances
SP-CR4	I am afraid of the unknown future
SP-CR5	My interest in activities inside/outside university is greater than my interest in studying
SP-CR6	I am qualified to refute claimed destructive ideas that target my society.
SP-CR7	It seems to me that I do little with the time I spend studying
Self-awareness and Interpersonal Interaction (SA-II)	
SA-II1	I feel underappreciated by my friends
SA-II2	I am embarrassed for not keeping up with my colleagues in the level of life skills.
SA-II3	I always prefer to sit in the back rows in the classroom
SA-II4	I have experimented with taking stimulants during the probationary period
SA-II5	My parents get annoyed when my friends visit me
SA-II6	I find it difficult to build relationships with others
SA-II7	My parents interfere a lot in my private affairs
Communication and Personal Behaviour (C-PB)	
C-PB1	I tend to be withdrawn and isolated from others
C-PB2	I can't control myself when I am angry
C-PB3	I usually get negatively affected/bothered by friends.
C-PB4	I find it hard to focus my attention
C-PB5	I suffer from mood swings
C-PB6	I don't have a best friend