



The impact of transformational leadership on classroom interaction in UAE secondary schools

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Abstract

Department heads play a critical role in executing school plans, particularly in adopting contemporary instructional methods, integrating technology, assessing student progress, and maintaining high standards of classroom interactions. They facilitate essential interactions within the classroom, spanning teacher-student, student-student, and student-content interactions, aligning with transformational leadership practices. This study explores the influence of department heads' transformational leadership on classroom interaction, mediating teachers' teaching experience in enhancing leadership capacity. Using a straightforward random sampling procedure, 374 teachers from 226 privately owned secondary schools were selected. Descriptive statistics were employed to represent the extent of department heads' engagement in transformational leadership practices. Findings indicate that teachers' role in clarifying activities and assignments to encourage classroom involvement received the highest average rating, emphasizing the importance of diverse instructional approaches. The study reveals a significant, positive influence of teachers' years of experience as a moderating factor in the relationship between department heads' transformational leadership and classroom interaction. A positive correlation was observed between student-teacher interactions and department heads' use of transformational leadership practices, with teachers' experience levels shaping these relationships. Notably, the study suggests that teachers' experience partially affects this phenomenon. The research concludes with recommendations for policymakers and educators to leverage their pedagogical expertise in fortifying the impact of school leadership on heightened student participation within the classroom.

Keywords Department Heads' transformational leadership · Classroom interaction · Teaching experience · UAE private secondary schools · Quantitative analysis

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1 Introduction

Despite the critical significance of the department head's role within educational institutions, the academic literature has shown a relatively limited focus on delineating the characteristics of an effective department head (Coats, 2000; Williams, 2001). Yelder and Codling (2004) assert that academic leadership, encompassing department heads, requires a more precise definition. Middle leadership or management in schools primarily comprises department heads (Shaked & Schechter, 2017a), who bear responsibility for achieving educational objectives, fostering collaboration, and guiding specific academic activities. Consequently, establishing a comprehensive definition of the role of the department head is imperative to address pertinent issues in this domain. In academia and management, multifaceted leadership and decision-making processes emerge. These terms encompass determining future directions, objectives, visions, and goals. An ethical approach by the department head is essential to foster an environment of ethical, professional, and interpersonal interactions among personnel in leadership positions (Osseo-Asare et al., 2005).

Building on Middlehurst (1993), Gordon and Patterson (2006) underscores five pivotal academic leadership dimensions: 1. accountability, 2. mentoring, 3. achieving results, 4. personnel management, and 5. distinguishing leaders from their counterparts. This study adopts the nomenclature "Department Head (DH)" to signify a leadership role within the school, responsible for collaborating with school leadership to uphold high standards in teaching and learning practices under the guidance of the Head of Curriculums (Bolam & Turner, 2003). Furthermore, department heads necessitate appropriate training not only in their administrative roles but also in curriculum development and pedagogy. This expectation often leads to perceptions among teachers that department heads are primarily faultfinders (Alkutich, 2017).

In line with these demands, it is critical that department heads receive further training in the ever-evolving curriculum (Tapala, 2020) to ensure effective teaching and support for personnel development (Christie et al., 2007; Mampane, 2017). Thorpe and Bennet-Powell (2014) emphasize the primary responsibility of department heads in enhancing curriculum leadership to elevate the performance of students and teachers, thereby facilitating effective handling of various classroom situations and educational content.

The department head's role assumes a pivotal position in bridging the gap between classroom dynamics and school objectives. This is achieved by providing necessary resources, professional development opportunities, and facilitating the teaching and learning process. Department heads play a crucial part in implementing school plans, especially when it comes to adopting contemporary instructional methods, technology, student progress assessment, and maintaining high standards of classroom interactions (Tapala, 2019). They are also responsible for conducting classroom visits and lesson observations to ensure qualitative and quantitative curriculum implementation (Ogina, 2017). Their role extends to

monitoring syllabus coverage in each subject, necessitating substantial training and development (Tapala, 2020).

While the leadership of department heads holds a delicate position due to its significant impact on daily educational operations and goal attainment (Tapala et al., 2022), it remains imperative to elucidate the direct influence of department heads on classroom participation. Leadership styles have evolved to address the multifaceted challenges encountered, with department heads emerging as key figures in achieving and sustaining educational reform. The extent of their responsibilities varies according to school size and the scope of their duties. They may oversee one or more subjects and departments, ensuring positive learning outcomes and teacher performance (Ogina, 2017; Tapala, 2020). Their oversight extends to managing the divisions they lead (Bambi, 2012), and they bear the ultimate accountability for student and teacher performance (Manasseh, 2016). As part of their curriculum leadership responsibilities, department heads must supervise and moderate the work of teachers and students.

In a related study by Al-Ghamdi (2008), it was observed that department heads have developed extensive educational competencies, particularly in student assessment methods, teaching method diversity, and classroom interaction, albeit with moderate proficiency in planning and the utilization of teaching aids. These findings underscore the need for a transformational leadership role for department heads to enhance classroom interaction by supporting teachers throughout the planning, implementation, and evaluation processes and by providing solutions and proposals to elevate the quality of classroom interaction.

In many educational systems across the globe, the position of the Department Head occupies a significant role within the framework of middle leadership or management in schools (Shaked & Schechter, 2017b). These individuals are also variously referred to as curriculum leaders, subject leaders, subject coordinators, and, in the United Arab Emirates (UAE), as department heads (MoE, 2017). The role of an educational department head is defined as "a facilitator and advisor appointed by the school administration to aid teachers in their personal and professional development" (Al-Balawi, 2011). Procedurally, an educational department head is designated as a teacher appointed by the school administration to oversee the educational process with the objective of achieving academic and educational goals, improving teachers' performance, and enhancing their professional competence through various supervisory techniques.

The contemporary understanding of the role of department heads, which the department head and school administration should embrace, revolves around the fundamental notion that all teachers possess the potential for professional growth provided they are placed in an environment conducive to making informed choices for effective teaching and goal attainment (Mulford, 2003). Consequently, the traditional practices of department head leadership, which primarily involve advice and direction, have given way to a more modern and nuanced concept of leadership (Bennett, 2008).

These definitions closely mirror the description of department heads in the UAE, where they are perceived as facilitators, observers, developers, supervisors, and guides in the teaching and learning process. Nevertheless, department heads

are often encumbered with numerous administrative tasks, which, at times, reduce their capacity to effectively manage their departments and actively engage in subject development activities (Fullan, 2015; Flückiger et al., 2015; Lárusdóttir & O'Connor, 2017; Javadi et al., 2017).

In their study, Elyakim et al. (2023) identified four modalities of the principal's ongoing leadership presence in social media networks: branding and communicative, transformational, supportive-protective, and enforcement presence. In this study, transformational leadership is employed as a focal variable, aligned with the UAE perspective, given the prevalent utilization of transformational leadership by school leaders in the UAE (Alshammari & Al-Mahdy, 2018; Al-Taneiji & McLeod, 2019; Alzaydi & Alghamdi, 2019). A comparison of leadership styles among 22 principals in public and private schools in the UAE indicated that transactional and passive/avoidant leadership styles were less frequently practiced (Al-Taneiji & McLeod, 2019). Furthermore, research conducted by Ibrahim and Al-Taneiji (2012), examining the relationships between the principal's leadership style (transformational, transactional, or laissez-faire) and school performance, underscored the predominance of transformational leadership over other styles. Consequently, the selection of transformational leadership as the focus of this study is substantiated.

From a UAE perspective, studies have yielded mixed results regarding the use of dimensions of transformational leadership. Burns (1978) transformational leadership traits, which encompass idealized influence, intellectual stimulation, personalized attention, and inspirational motivation, resonate with the practices of department heads. Idealized influence, as defined by Bass (1985), signifies the transformative leader's ability to convey a compelling vision and motivate followers effectively. In the UAE, Al-Taneiji and McLeod (2019) conducted a study involving 22 private and public school principals, revealing Burns (1978) dimensions, including idealized influence, intellectual stimulation, personalized attention, and inspirational motivation in the practices of UAE school leaders. However, a study by Alshammari and Al-Mahdy (2018) involving 30 public school principals produced slightly different findings, highlighting patterns of idealized influence and individualized consideration among school leaders. In their qualitative study of ten public schools, Alzaydi and Alghamdi (2019) identified the presence of inspirational motivation and intellectual stimulation practices among UAE school principals. Consequently, this study incorporates all the dimensions of transformational leadership, acknowledging the variability in study results.

Classroom interaction" encompasses the dynamic exchanges that transpire among educators and learners or between learners themselves (Eisenring & Margana, 2019; Li, 2023; Tsui, 2001). It may also encompass the interactions between educators. Historically, studies on classroom interaction primarily centered on the language employed by instructors and students, the resulting interactions arising from this language use, and the consequential impact on students' learning capabilities (Waring, 2017; Sert, 2019). Recent research endeavors have ventured beyond these surface-level analyses to explore the underlying factors that mold classroom interaction. These influencing factors include the beliefs held by educators and students, the socio-cultural backgrounds of educators and students, and the psychological dimensions of the learning process (Sundari, 2017; Tsui, 2001). Moore's model has been

the basis for the development of subsequent interaction models (Anderson, 2003a, 2003b; Hirumi, 2013), encompassing various forms of interaction, such as teacher-student interaction and student-interface interaction. Research suggests that learning is a product of students' interactions with educators and peers, irrespective of the context of these interactions (Tirri & Kuusisto, 2013).

Both student-teacher and student-student interactions entail multifaceted communication processes involving two or more individuals. Student-student interaction involves the reciprocal exchange of ideas, information, and knowledge related to the subject matter. Teacher-student interaction pertains to communication between educators and students, which can take on various forms, including assessment, feedback, guidance, and support. "Student-content interaction" pertains to the relationship between students and the educational material as they engage with and reflect upon it (Moore & Kearsley, 1996; Anderson, 2003a, 2003b; Miyazoe & Anderson, 2010). Overbaugh and Nickel (2011) also underscore the significance of interactions between educators and students in fostering a sense of community and, consequently, enhancing student satisfaction (Kuo et al., 2014). This study places its focus on the interactions occurring within the classroom, encompassing teacher-student, student-student, and student-content interactions. It aims to elucidate the influence of department heads' transformational leadership practices in effectively facilitating classroom interactions by fulfilling their roles and responsibilities.

Moreover, studies have indicated that experienced teachers tend to be more responsive to the directives of department heads compared to their less experienced counterparts. In the realm of school improvement activities, research by Leithwood et al. (2002) emphasized that experienced teachers aligned their activities more closely with school leaders' mission and vision. Similarly, the OECD (2019) found that experienced teachers placed greater value on school leaders' feedback and support than those with less experience. Notably, head teachers often encounter challenges in acquainting new teachers with the curriculum instruction, as reported in a study by Edutopia (2020). Teachers with over 15 years of experience were found to engage less effectively in cooperative activities concerning instructional plans (Ronfeldt et al., 2015), requiring leadership support and a sense of significance in their work compared to their less experienced counterparts (Walker & Slear, 2011). Additionally, teachers with over seven years of experience encountered challenges beyond the classroom, necessitating greater teaching support (Louws et al., 2017). Thus, understanding how teaching experience can influence the relationship between leadership and classroom interactions is of paramount importance.

Based on this conception, the following research questions were formulated to investigate the impacts of department heads' transformational leadership practices on classroom interaction in UAE secondary schools:

1. What is the Department heads' transformational leadership practice level in UAE private secondary schools?
2. What is the level of classroom interaction among teachers-students and students-students, and student-content in UAE private secondary schools?
3. Do department heads' transformational leadership practices significantly impact classroom interaction?

4. Does teachers' teaching experience moderate the relationships between the department heads' transformational leadership and classroom interaction?

2 Literature review

2.1 Department heads' transformational leadership

In many countries, the Department Head is part of the school's middle leadership or management structure (Shaked & Schechter, 2017b). They are also termed curriculum leaders, subject leaders, subject coordinators, and departmental heads, as they are called in UAE (department heads) (MoE, 2017). The educational department head is "the facilitator and advisor appointed by the school administration, who helps teachers develop themselves personally and professionally" (Al-Balawi, 2011). The educational department head is procedurally defined as a teacher assigned by the school administration to supervise the educational process to achieve its academic and educational goals to improve teachers' performance and raise their professional levels through various supervisory methods.

The modern concept of the department head that the department head and head of the school should adopt is based on the fundamental idea that all teachers have the potential for professional development to the extent that they can make the right choices to plan effective learning and accomplish their goals if they work in the right environment (Mulford, 2003). Consequently, the traditional practices of the department head's leadership, based on advice and direction, have replaced a more contemporary idea of leadership (Bennett, 2008).

All the previous definitions are identical to the description of the department head in the UAE, as the department head is considered a facilitator, an observer, a developer, a supervisor, and a guide to the teaching and learning process. In addition, department heads are nevertheless needed to carry out a lot of administrative tasks while spending less time managing their departments and participating in subject development activities (Fullan, 2015; Flückiger et al., 2015; Lárusdóttir & O'Connor, 2017; Javadi et al., 2017). This study used transformational leadership as a study variable from the UAE perspective because it is evident that UAE school leaders mostly use transformational leadership in their practices (Alshammari & Al-Mahdy, 2018; Al-Taneiji & McLeod, 2019; Alzaydi & Alghamdi, 2019). While comparing the methods of different leadership styles, such as transformational, transactional, and passive/avoidant leadership styles of 22 principals in UAE public and private schools, transactional and passive/avoidant leadership styles exhibited less practice (Al-Taneiji & McLeod, 2019). Similarly, Ibrahim and Al-Taneiji (2012) examined the relationships between the principal's leadership style (transformational, transactional, or laissez-faire) and school performance, which indicated the dominance of transformational leadership over others. Thus, the use of transformational leadership for this study is more justified.

Different studies found mixed results from UAE perspectives regarding the use of dimensions of transformational leadership. Burns (1978) transformational leadership traits—idealized influence, intellectual stimulation, personalized attention,

and inspiring motivation—apply to these department heads. Bass (1985) defines idealized influence as the transformative leader's ability to communicate a vision and motivate followers convincingly. In the UAE, Al-Taneiji and McLeod (2019) conducted a study on 22 principals in private and public schools concerning transformational leadership practices. They found the presence of Burns (1978) dimensions, such as idealized influence, intellectual stimulation, personalized attention, and inspiring motivation in the practices of UAE school leaders. However, Alshamari and Al-Mahdy's (2018) study on 30 public school principals showed slightly different results in that they found patterns of idealized influence and individualized consideration among school leaders. In their qualitative study on ten public schools, Alzaydi and Alghamdi (2019) found inspirational motivation and intellectual stimulation practices among UAE school principals. This study employed all the dimensions of transformational leadership, as different study results are inconsistent.

2.2 Classroom interaction

Classroom interaction refers to the interaction between the instructor and the learners or among the learners (Eisenring & Margana, 2019; Li, 2023; Tsui, 2001). It may also refer to the contact between the teacher and other teachers. The earlier study on classroom interaction mainly focused on the language that the instructor and the students used, the interaction that emerged from the language, and the impact of the interaction on the student's ability to learn (Waring, 2017; Sert, 2019). Recent studies have begun to examine the underlying factors that shape classroom interaction. These factors include beliefs held by teachers and students, the social and cultural backgrounds of teachers and students, and the psychological aspects of learning (Sundari, 2017; Tsui, 2001;). Based on Moore's model, further interaction models have been constructed by (Anderson, 2003a, 2003b; Hirumi, 2013), including models for various types of interaction (teacher-student interaction, student-interface interaction). According to research, learning occurs whenever students connect with teachers and other students, regardless of the contact situation (Tirri & Kuusisto, 2013).

Both student-teacher and student-student interactions include a process of communication between two or more individuals. Student-student interaction is a two-way street where students share Ping, ideas, information, and knowledge about the course. Interaction between students and teachers refers to communication between them. It may take various forms, including assessment, feedback, and direction or assistance. "Student-content interaction" refers to the relationship between students and the course material as they develop and reflect on it (Moore & Kearsley, 1996; Anderson, 2003a, 2003b; Miyazoe & Anderson, 2010). Overbaugh and Nickel, (2011) also mentioned that the interaction between students and teachers is critical for fostering a feeling of community and, as a result, increasing student happiness. Effective teacher-student interaction (TSI) is crucial for promoting learning efficiency and fostering harmonious interpersonal relationships between teachers and students (Jiang et al., 2023; Kuo & Yu-Chun, 2014).

This study focuses on the interactions that occur in the classroom with the interaction forms between teacher–student, student–student, and student–content, which reflects the department heads’ transformational leadership practices in enabling classroom interaction effectively by fulfilling the DHTL roles and responsibilities.

2.3 Department heads’ transformational leadership practices and classroom interaction

Interactions between school leaders and teachers have undergone tremendous changes ((Ping et al., 2023). Evidences show that transformational leadership fosters frequent interaction with teacher which significantly promote teachers’ job satisfaction, student learning, and participation in the classroom (Bolkan & Goodboy, 2009; Liang & Zhang, 2021). Hallinger’s (2003) research on educational leadership has linked leadership behaviors that indirectly affect student academic achievement development through their behaviors and actions and affect what is going on in the class. It also has an impact on the effectiveness of teachers’ performance. This highlighted the role of leadership in promoting students’ continuing education and teachers’ professional development. Effective educational leadership is of great importance to achieving success for the school, and many programs have been adopted around the world to train academic leaders in schools to achieve this success and, thus, the educational institution’s success (Hallinger, 2005). Hallinger also concluded that progress had been made in finding a model through which the tasks performed by the academic leader can be determined and that have an impact on the learning process, as well as in his possession of competencies, experiences, and visions in which he can develop the learning in collaboration with the rest of the members the learning community to ensure the dissemination and achievement of the school’s vision and goals. (Hallinger, 2011). Alkutich (2017) examined the impacts of the Department head’s (DH) leadership on Arabic language instruction at two Abu Dhabi private schools. In this study, teachers viewed them as fault finders, needing to lead by example and continuous professional development. Leithwood (2016) examined 42 studies from traditional literature searches to determine how department-head leadership affects student learning, how departments compare to schools as change agents, and the barriers to significant department-head leadership. The study found schools and school administrators have less impact on classroom interaction than department heads. Well-performing departments may improve without school leaders. Leithwood (2016) also identified reasonable departmental and personal leadership procedures. These strategies and materials reflect a proven school leadership model. In its mini-dissertation data, Rajoo (2012) suggests that the HoD/middle manager/curriculum increases learning and teaching. As middle management, the Head of Department (HoD) should have the vision to attain academic excellence in a subject area and holistically develop learners.

In New Zealand, Highfield’s (2012) surveys identified five intermediate leadership traits: teamwork, clear goals and objectives, student academic achievement, resource management, and a pleasant learning environment for students and instructors. In addition, among 30 departments in 10 institutions, the results showed that

certain variables positively correlated with academic achievements and others adversely. Middle leaders had better certification scores but not NCEA Level 1 (15-year-old) outcomes. Goals, resource management, and a good learning environment predict academic performance.

2.4 The role of teaching experience in enhancing leadership capability and interaction

Teaching experience helps students understand leaders' instructions (Hallinger & Heck, 1996), receive effective guidance and support (Leithwood et al., 2004), and thus influence classroom practices and student achievement. In line with this, Robinson et al. (2008) revealed teaching experience as one of the factors that help HoDs enhance a conducive and orderly learning environment. A study by Day et al. (2009) explored the relationship between school leaders' professional development, learning, and capacity building and their impact on student outcomes. They discovered that experienced teachers developed a shared vision and collaboration with leadership, which enhanced teaching and learning quality. In connection with better student achievement in mathematics, reading, and science in PISA, Hallinger et al. (2014) discovered a strong association between more experienced teachers and leadership instructions. Based on this evidence, this study assumed that teachers' experiences (moderating variable) might influence the HoD's transformational leadership style (independent variable) and classroom interaction (dependent variable).

3 Materials and methods

3.1 Research design and data collection

The present quantitative study employs a correlational methodology to examine the association between the department heads and classroom interaction and the moderation of teachers' teaching experience in UAE private secondary schools. The questionnaire was distributed to more than the required sample, so about 400 questionnaires were sent to ensure that all the required data were collected. Two hundred were sent via a Google form, and two hundred through schools were done on paper. The questionnaire instrument comprised three different existing questionnaires, from which the research instruments were adapted and adopted for use in this study. The questionnaire consists of two main subsections: demographic variables, Department Heads' Transformational Leadership, and Classroom interaction. This research conducted a comprehensive survey among educators to assess the extent to which department heads' transformational leadership practices impact classroom interactions within private secondary schools in the United Arab Emirates (UAE). These private schools encompass various curricula, including American, British, Indian, Asian, and Arabic, where the roles and responsibilities of department heads tend to be more subject/department-specific. To ensure the questionnaire's reliability and validity, a pilot study was conducted with a random sample of 30 participants from a

secondary school in Ras Al-Khaimah. The participants provided feedback and comments on the questionnaire's clarity and comprehension. The reliability of the questionnaire was assessed using Cronbach's alpha, resulting in a coefficient of 0.934 for the instrument developed for teachers, which consisted of 23 items. Several modifications were made to enhance the questionnaire's clarity and comprehensibility, including reorganizing instructions and providing definitions for terms participants found challenging to understand, such as "classroom interaction types."

3.2 Participants

Based on the statistical data available for the year 2020, the study's population was initially estimated, revealing approximately 6,452 teachers within the secondary education sector of private schools in the UAE. The research sample consisted of 226 private secondary schools and a total of 374 teachers.

In terms of their teaching experience, 85 teachers (22%) of the participants have years of experience from (1–5) years, whereas 114 of the teachers (31%) had teaching experience between 4 to 7 years. In the meantime, 126 teachers (33.6%) have years of experience from (6–15) years, while 93 teachers (25%) and 43 teachers (11%) of the participants have (21–25) years, and (11%) also have (more than 25 years of experience) in the field of teaching (Table 1).

3.3 Instruments

The questionnaire used in this study was developed based on an extensive literature review to investigate the impact of department heads' transformational leadership practices on classroom interaction. It aimed to identify the critical competencies for department heads to lead the teaching and learning process effectively.

The questionnaire consists of three sections. The first section collects demographic information, including participants' gender, to assess whether gender plays a role in department heads' leadership. The second section comprises the Department

Table 1 Demographic information of respondents ($n=374$)

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	113	30%	30%	30%
	Female	261	70%	70%	70%
Teaching Experience	1–5 years	85	22%	22%	22%
	6–15 years	114	31%	31%	31%
	16–20 years	93	25%	25%	25%
	21–25 years	43	11%	11%	11%
	More than 25	40	11%	11%	11%
Total		374	100.0	100.0	100.0

Heads' Transformational Leadership Scale (DHTL), which includes ten items. The third section covers the Classroom Interaction Scale (CI), which measures various aspects of classroom interaction, including teacher-student, student-student, and student-content interactions, and their influence on learning. This section consists of thirteen items. Respondents used a five-point Likert scale (ranging from "Strongly agree" to "Strongly Disagree"), where a higher score (5) indicates a stronger presence of the construct. In comparison, a lower score (1) suggests a weaker presence of the construct.

3.3.1 Department heads' transformational leadership (DHTL)

A total of 10 items were used in the study to validate the instrument to examine Department heads' leadership (DHL) in schools. Previous research has shown that the dimensions included in the Leithwood leadership survey are reliable, with Cronbach's alpha scores ranging from 0.78 to 0.85 (Leithwood & Jantzi, 2006). Four dimensions of the Leithwood School Leadership Survey exhibit internal solid consistency, according to a recent study by Boberg and Bourgeois (2016). The researchers reported Cronbach's alpha coefficients for each dimension: a) defining goals: 0.93, b) developing people: 0.93, c) reorganizing the company: 0.94, and d) enhancing the company: 0.95. A Cronbach's alpha coefficient of 0.98 was reported for the complete scale of Transformational School Leadership. According to the study conducted by Boberg and Bourgeois in 2016, it was found that.

3.3.2 Classroom interaction (CI)

A total of (13) items were used in the study to validate the instrument to examine classroom interaction. A previous study used Cronbach's alpha to perform the reliability test, with scores ranging from 0.713 to 0.913. These findings indicate that the items in each factor have high internal consistency or may be used to test the same underlying meaning of the factors, indicating that the factor analysis is adequate. The original scale consisted of three dimensions: 'Teacher-student,' 'student-student,' 'student-content'. The number of items under each dimension comes from a) 4 items for 'Teacher-student' based on the study of (Balagová & Haláková (2018), b) 4 items for 'student-student' from Lasfeto, (2020) study, and c) 5 items from the study of Çakiroğlu et al. (2009) for the 'student-content.'

3.4 Data collection and analysis procedures

Multiple data collection methods were employed in this research study. Initially, a total of 400 questionnaires were distributed to teachers. The first stage involved obtaining consent letters from the faculty, followed by supervisor approval. Questionnaires with proper authorization were submitted to the UAE Ministry of Education for approval to conduct research within educational institutions. School administrators subsequently granted permission for questionnaire distribution to instructors. Instructors were selected using a basic random sampling technique.

Each participant received a physical copy of the questionnaire and was given sufficient time to complete it, with a seven-day response period. The data collection faced challenges, particularly in transporting and collecting questionnaires from the seven Emirates (cities). The online Google Form survey was distributed via email and WhatsApp groups to expedite responses. Data collection began in September 2022 and extended over several months due to unforeseen difficulties in some schools, including teachers' heavy professional commitments and the end of the academic year. To ensure sufficient data collection, more than the required sample of 400 questionnaires were sent, resulting in a response rate exceeding 85%. In total, 374 responses were collected, surpassing the target population size.

The collected data were analyzed using SPSS (Version 29) to address the research questions. Descriptive and inferential statistics were applied to uncover findings. Central tendency and data dispersion were assessed, and measurement reliability was evaluated using Cronbach's alpha. Descriptive analysis was employed to identify prevalent practices, while regression analysis examined the associations between dependent and independent variables. The mean scores in this research were categorized into three levels of interpretation: a mean value between 1 and 2, considered in the lower range; values from 3 to 3.99, classified as moderate; and values ranging from 4 to 5, commonly regarded as high, following the categorization proposed by Hoque et al. (2020).

In order to assess the extent of transformational leadership practices and classroom interaction among department heads, descriptive statistics, specifically percentages. The research used a method of item-level analysis wherein the perceptions categorized as 'strongly agree' and 'agree' were combined into a single positive perception, represented as percentages. The mean and standard deviation were utilized to determine the level of each variable, as well as their respective dimensions (sub-constructs) and items.

To ascertain the direct relationship or effect between the variables under study, the researchers utilized partial least squares structural equation modeling (PLS-SEM). The study employed a hierarchical component model (HCM) consisting of reflective-formative and reflective-reflective constructs, necessitating a two-stage analysis approach. The researcher used a two-stage hierarchical component model (HCM) analysis, utilizing a repeated indicator approach and latent scores to address the challenges associated with this particular analytical framework (Hair et al., 2017). During the initial phase, a methodology known as the repeated indicator approach was employed to obtain the latent variable scores about the subconstructs or lower-order components (LOC). Subsequently, the latent inconsistent scores are utilized as indicators, specifically manifest variables, within the higher-order construct (HOC) measurement model in the subsequent phase of the analysis. The evaluation of the structural model was initiated by examining the presence of collinearity issues within the model. Path coefficients were estimated using ordinary least squares (OLS) regression to assess the direct relationship between variables. This involved regressing endogenous variables on their corresponding antecedent variables or constructs. The hypothesized relationships among the variables in the present study were directional.

Table 2 Skewness and Kurtosis

Constructs	Mean	Std. Deviation	Skewness	Kurtosis
DHTL	3.9460	.81939	-.787	.599
CI	4.2100	.74807	-1.513	3.184

Table 3 Teacher's response to items under transformational leadership

	N	Mean	Std. Deviation	Level
DHTL1	374	4.112	.991	High
DHTL2	374	4.016	1.089	High
DHTL3	374	3.904	1.058	Moderate
DHTL4	374	4.003	1.048	High
DHTL5	374	4.053	.988	High
DHTL6	374	3.805	1.071	Moderate
DHTL7	374	3.869	1.060	Moderate
DHTL8	374	3.757	1.203	Moderate
DHTL9	374	4.005	1.050	High
DHTL10	374	3.930	.981	Moderate

The research employing Partial Least Squares Structural Equation Modeling (PLS-SEM) must take measures to verify that the analyzed data do not show a substantial departure from normality. This can be accomplished by evaluating the degree to which the data deviate from a distribution that adheres to the normal distribution. Hence, normality can be evaluated by obtaining skewness and kurtosis values, as proposed by Hair et al. (2017). Hence, the determination of data normality in this study was predicated upon the statistical analysis of skewness and kurtosis. Table 2 shows skewness and kurtosis values for the overall variables of the study (Table 3).

4 Results

4.1 Respondents' experience

The inclusion of experience is considered a crucial component in providing support for this study. Most teachers who participated in this study possessed ample teaching experience. A total of 85 participants, constituting 22% of the sample, reported having 1 to 5 years of teaching experience. Additionally, 114 teachers, accounting for 31% of the participants, indicated having teaching experience ranging from 4 to 7 years. Altogether 126 teachers, accounting for 33.6% of the participants, possess 6 to 15 years of teaching experience. Additionally, 93 teachers (25%) have accumulated between 21 and 25 years of experience, while 43 (11%) fall within the same range. Furthermore, 11% of the participants have acquired more than 25 years of experience in teaching.

4.2 Level of department heads' transformational leadership practices

Table 4 shows that the teachers' opinion of their department heads' transformational leadership had a mean score of 3.945. According to the data above, mean values indicate a moderate level of satisfaction in most areas.

Table 4 shows participants' first axis paragraph replies. Item 1, "Department Head seeks high expectations for your teaching," obtained the highest average score of 4.12. Participants strongly feel the Department Head values good teaching standards. Teacher performance is directly affected by such expectations. Paragraph (5), where the department head promotes best practices in teaching and learning to meet curricular goals, took second place. The arithmetic mean of 4.05 shows that the department head's support and motivation of people and staff are vital to curricular goals. Paragraph (2) emphasizes the department head's role in encouraging innovative teaching concepts, ranking third. This paragraph averaged 4.01 with a standard deviation of 1.091. To sum up, the department head's support as a form of transformational leadership style is essential for encouraging new and varied teaching methods that foster creative and good thoughts .

4.3 Level of classroom interaction

The level of classroom interaction was measured at a high rate (4.204). The first item, on teacher-student interaction, highlighting the teacher's role in clarifying activities and assignments to encourage classroom involvement by presenting examples and explanations, had the highest average rating of 4.307. Student-student interaction significantly impacts educational outcomes, highlighting its importance. The third item about integrating students into group class activities had the highest

Table 4 Teacher's response to items under CI

	Mean	Std. Deviation	Level
Teacher-Student			
CITS1	4.214	.903	High
CITS2	4.307	.883	High
CITS3	4.283	.931	High
CITS4	4.305	.885	High
Student-Student			
CISS1	4.083	.926	High
CISS2	4.158	.904	High
CISS3	4.214	.870	High
CISS4	4.070	.925	High
Student-Content			
CISC1	4.211	.914	High
CISC2	4.190	.939	High
CISC3	4.257	1.018	High
CISC4	4.217	.921	High
CISC5	4.222	.869	High

arithmetic mean of 4.214. After that, the third item on student-content interaction, "pictures and shapes help students engage in the classroom." The arithmetic mean was 4.25%. This emphasizes the need to add forms, diagrams, and visuals to interest students. Overall, the study found that the teacher’s role in clarifying activities and assignments to encourage classroom involvement by presenting examples and explanations, had the highest average rating which emphasizes the need to add forms, diagrams, and visuals to interest students.

4.4 DHs’ Transformational Leadership Practices and Classroom Interaction

The regression analysis has been performed to determine the effect of DHTLP on CI. The results show that DHTLP significantly impacts classroom interaction ($\beta=0.659$). The results of the study are presented in Tables 5.

As shown in Table 7, as a whole, the model is significant (R^2 change=0.434, $F=0.000$, $p<0.05$). The coefficient table (Table 6) shows the impact of the independent variable (TL) on Classroom interaction (CI). The β value of TL ($\beta=0.588$, $p\geq 0.05$) significantly impacts CI. It means TL explains 58.8% of the variance in CI.

4.5 Teaching Experience as a Moderator

Table 7 shows the interaction between department heads’ transformational leadership practices and teachers’ years of teaching experience (t -value=0.476) significantly and positively influences the relationship between DHTLP and classroom interaction (CI).

This finding underscores the importance of considering teachers’ years of teaching experience as a moderating factor when exploring the impact of DHTLP on CI.

Table 5 DHTLP on CI

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	SE	B		
1 (Constant)	1.891	.140		13.470	<.001
DHTLP	.588	.035	.659	16.892	<.001

a. Dependent Variable: CI

Table 6 Model summary

Model	R	R Square	Adjusted R Square	SE of the Estimate
1	.659 ^a	.434	.433	.56350

a. Predictors: (Constant), TL

Table 7 Results of moderator analysis

	Std. Beta	Std. Error	t-value
DHTLP * TYE CI	-0.036	0.075	0.476

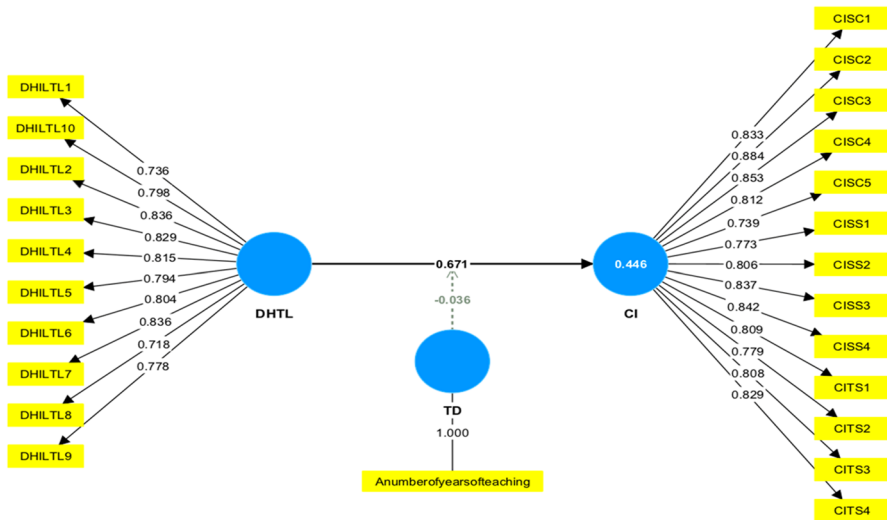


Fig. 1 Moderation analysis

Additionally, the interaction coefficient between department heads' transformational leadership practices and teachers' years of teaching experience was negative ($\beta = -0.036$), indicating that the interaction effect has a negative influence on the relationship between department heads' transformational leadership practices. In this context, it suggests that as teachers' years of teaching experience increase, the impact of department heads' transformational leadership practices on the outcome becomes less favorable or more negative (Fig. 1).

5 Discussion

This study emphasizes the crucial role of department heads' support, a form of transformational leadership, in promoting diverse teaching methods that nurture creativity and critical thinking. Leithwood and Jantzi (2000) propose a direct connection between transformational leadership and student learning, with Harvey et al. (2003) highlighting its positive impact on student learning. Research, including Cheng and Tam (1997), underlines the correlation between transformational leadership strategies employed by department heads and increased student engagement and classroom interaction.

Similarly, Wang et al. (2019) investigation shows a positive association between the adoption of transformational leadership strategies and enhanced collaboration among teachers, as well as increased student engagement. The study contends that department heads' transformational leadership practices directly influence classroom interaction by fostering a positive school climate, encouraging collaboration among teachers, setting high expectations, and providing personalized support to both students and teachers.

In contrast, comparative studies, like Alkutich's (2017), reveal discrepancies in recognizing the impact of department heads' transformational leadership on classroom interaction within some UAE societies. This study acknowledges the need for further research to understand the varying effects of department heads' transformational leadership in diverse UAE communities. Cultural and social factors, such as differing perspectives on teacher autonomy and the role of department heads in instructional leadership, may contribute to these variations.

The research also explores the moderating effect of teachers' experience on the relationship between department heads' transformational leadership and classroom interactions. It suggests that as teachers gain more experience, the influence of department heads' leadership may diminish due to increased teacher autonomy, aligning with OECD findings (2019). Moreover, the study underscores the importance of leadership education for department heads, advocating policy-level actions to enhance their skills.

Notably, the research observes concerns among instructors regarding department heads' involvement in curriculum and unit creation in centralized systems. It suggests that department heads' formative input and collaborative efforts are underutilized transformational leadership techniques in UAE secondary schools.

6 Practical implications

The findings of the current study bear significant implications for theories, policy-makers, and practitioners, particularly school leadership and department heads in UAE schools. Distinguished by its unique exploration of department heads' transformational leadership and its impact on classroom interaction in UAE secondary schools, this study stands out as one of the most critical in the country. The practical implications derived from these findings extend to department heads, who are urged to employ transformational leadership practices to foster classroom interactions conducive to student learning. However, the choice of leadership style should be attuned to the diverse personal and contextual needs of teachers.

In supporting blended learning practices, department heads can cultivate a collaborative working atmosphere among teachers, fostering knowledge sharing, peer support, and the exchange of innovative teaching practices. This collaborative approach instills a sense of shared purpose and collective growth, ultimately enhancing classroom interactions. Additionally, department heads are encouraged to actively support and motivate teachers by providing tailored professional development opportunities and resources. This proactive support empowers teachers, boosting their confidence and enthusiasm for implementing effective teaching practices, thereby positively influencing classroom interactions.

The study underscores the evidence supporting the adoption of transformational leadership by department heads, emphasizing the promotion of collaboration, motivation of teachers, and provision of individualized support to create an environment that values and supports classroom interactions. By doing so, department heads can effectively enhance classroom interactions, contributing to a positive and engaging learning experience for both teachers and students.

7 Limitations

The study acknowledges some limitations. The generalization of results is limited to UAE secondary schools, and the context specificity may vary. The inclusion of qualitative research methods, such as phenomenological or case studies, could provide deeper insights into how department heads' transformational leadership influences classroom interaction in the specific sociocultural context of UAE secondary schools.

8 Conclusion

The study establishes that the transformational leadership practices of department heads exert a significant influence on classroom interaction. Moreover, the research affirms that department heads' transformational leadership acts as an indicator of classroom interaction. These findings offer fresh insights into the pivotal role played by department heads' transformational leadership in advancing classroom interaction. The study underscores the importance of providing leadership education to department head candidates for the enhancement of their leadership skills. Advocating for policy-level actions, the study suggests initiatives such as developing a clear school vision, instituting staff evaluation systems, and adopting self-assessment techniques to improve the leadership abilities of department heads. The research concludes that the positive impact of department heads' transformational leadership practices on classroom interactions is evident in their contribution to fostering a conducive educational atmosphere, encouraging teacher collaboration, setting high expectations, and providing personalized support to both students and teachers.

For department heads to effectively promote classroom interaction, they must employ well-established and well-practiced transformational leadership methods. Particularly during periods of significant educational reform, such as the adoption of new UAE secondary schools, implications connected to both theory and practice become crucial drivers of essential changes. When incorporating the study's conclusions, it is imperative to carefully assess its limitations. A long-term investigation would provide valuable support for the research's conclusions.

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Data availability Data are preserved with the authors. They will be available upon request.

Declarations

Conflict of interest The authors declare no conflicts of interest.

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