

Title:

**Relationship between leadership style and effectiveness in exploring STEM skills in talented school students of Dubai**

---

**Guaranteed Grades - Projectsdeal.co.uk**

## Table of Contents

1. INTRODUCTION .....	3
1.1 Study Background .....	3
1.1.1 Meaning of leadership and its significance in schools .....	3
1.1.2 Understanding the significance of STEM talent in students .....	4
1.1.3 Need for STEM education in the schools of UAE .....	4
1.2 Research Rationale .....	5
1.3 Research Aim and Objectives .....	6
2. LITERATURE REVIEW .....	7
2.1. Scholarly Review .....	7
2.1.1. Most Effective Leadership Styles In School Settings And Challenges .....	7
2.1.2 Leadership Styles Mostly In Practice In The Schools Of Dubai .....	9
2.1.3. The implication of STEM education in the schools of Gulf Countries .....	10
2.2. Literature Gap .....	11
2.3. Theoretical framework .....	11
2.3.1. Theory of Transformation .....	11
2.2.2. Distributed Leadership Theory .....	12
2.2.3. Responsible Leadership Theory .....	12
2.4. Research Questions .....	12
3. METHODOLOGY .....	13
3.1. Research Philosophy .....	13
3.2. Research Design .....	13
3.3. Data Collection Protocol .....	13
3.4 Data Collection Instrument .....	14
3.4. Data Analysis Procedure .....	14
3.5. Ethical Consideration .....	14
4. Project Outline .....	15
5. References .....	16

## 1. INTRODUCTION

This section of the study will set the background for the research topic by discussing some background information:

### 1.1 Study Background

#### 1.1.1 Meaning of leadership and its significance in schools

Leadership as a term emerged from the Great Man Theory which indicates that some people are born with specialized qualities like friendliness, administrative skills, task control, social skills, supportiveness, charisma and intelligence. These skills make these people born leaders who are meant to lead others (Rahman, 2012). The definition of leadership has also evolved over the years. The traditional concept of leadership was confined to the specific position an individual held within a group or community (Klingborg, Moore and Varea-Hammond, 2006). But the modern definition evolved with time to describe leadership as the role that changes continuously with the changing situations. Therefore, a leader is indicated as a person who should be creative and honest and demonstrates strategic thinking skills through which people could be motivated (Klingborg, Moore and Varea-Hammond, 2006). Leadership is often viewed as a contested term because its definition varies from Eastern, Western, European and North American approaches (Western, 2019). However, in sum, leadership indicates a kind of social influence that a person uses for motivating and supporting the followers so that they can successfully achieve a shared ethical objective (Chin, 2015). From the 21<sup>st</sup> Century perspective, leadership is the quality of possessing skills like contingency and team leadership style beyond traditional leadership skills like social influence, intelligence and group support. A person having the attributes of a successful leader should have the ability to make the differentiation between success and failure and motivate the followers towards the path of development and produce desired results in the process (Rahman, 2012)

The quality of education imparted in educational institutions of a country play a key role in determining the quality of its labour market. Here, the teacher serves as the leader who can ensure that the students get the accurate skills and knowledge that will be required for enriching the quality of the country's labour market in the future. The new global policies also call for facilitation of the student mobility and the transformation of their social values so that social

problems can be effectively managed. These educational objectives can only be accomplished through effective leadership (Gratacos, Ladron de Guevara and Rodriguez, 2021). Effective leadership in the school setting is also capable of building a greater degree of mutual trust between the teachers and the students. Teachers possessing such leadership qualities directly engage in activities that would have a positive impact on the growth of the students. They also have efficient management strategies by virtue of which they can ensure that effective learning is taking place in terms of the achievement, development, performance and learning outcome of the students (Azar and Adnan, 2020).

### 1.1.2 Understanding the significance of STEM talent in students

STEM education is the acronym for science, technology, mathematics, and engineering. Governments, educators, businesses and industries across the world have felt the need to transform the education system so that students can be accurately prepared for fulfilling the requirements of the future workforce (Srikoom *et al.*, 2018). STEM education at the school level is also considered necessary in the identification and development of talents in the schools and in facilitating innovation and critical thinking potentials in them. STEM talent development is also integral for facilitating the overall development of 21<sup>st</sup>-century societies (Palomares, González and Fernández, 2022). Eventually, a global drive to integrate STEM education as part of general education emerged (Srikoom *et al.*, 2018).

### 1.1.3 Need for STEM education in the schools of UAE

The world is transitioning to a phase of drastic technological upgradation and its roots lie in Science, Technology, Engineering and Mathematics (STEM) education. The growth and prosperity of the economy of the UAE are mostly dependent upon its oil and natural gas reserves. Currently, UAE holds almost 6% of the natural oil production of the world. UAE also developed a projection to increase its crude oil production from 800,000 barrels per day in 2019 to 3.5 million barrels per day in 2020 (Al Murshidi, 2019). UAE also makes considerable foreign income by exporting hydrocarbons. However, there has been a parallel demand for alternate sources of energy all over the world. Eventually, electrically charged cars are being produced and energy needed by the industrial sector is produced from alternate sources instead of usurping the exhaustible fossil fuels. In such a scenario, a need has been felt among the

countries of UAE to diversify into non-oil sectors like tourism, trade, real estate, infrastructure, etc. to maintain their economic stability (Al Murshidi, 2019). Nevertheless, the countries in the UAE have also realized these diversifications will be enough for maintaining economic stability in the next five to twenty years considering the extent of technological innovations and developments that are going on all around the world. The world is facing the fourth industrial revolution or Industry 4.0 as it is termed. Hence, it is clear that technological infrastructure will be the key driver of the world economy and the focus of the time will be on science and technology (WEF, 2016; Al Murshidi, 2019). As a result, educational institutions all across the world are also shifting their focus of teaching and training towards areas of science, technology, engineering and mathematics. The objective behind this is to prepare the future generation well equipped to face the changes and challenges that will be brought by Industry 4.0 (Schiliro, 2013). Therefore, the schools of the countries of the UAE like Dubai have also decided to integrate STEM education from the school level and set up nurturing environments for STEM education for garnering interest in science and technology among the students (John and Manoj Mechankara, 2018).

## **2 Research Rationale** Grades - Projectsdeal.co.uk

This study has been developed with the background information that leadership skill is integral in helping students accomplish their learning objectives. A teacher who possesses appropriate leadership skills that comply with the demands of a particular academic environment is also able to identify and cultivate talent development in students. Additionally, the study investigated the reason behind the rising interest among 21<sup>st</sup> Century academic institutions around the world to integrate STEM learning with general education. Then the focus of the study was shifted to the UAE countries to understand the significance and state of STEM education there. It has been found out that the countries in the UAE have understood that STEM education should be encouraged among students from their schooling years so that they can cope up with the changing technological changes all over the world. Now, the rationale that has been developed is to understand how leadership skills the teachers of schools in Dubai will be able to discover STEM skills in the students. From the study, the leadership style that will prove most effective for the purpose can be identified. It is assumed that the research findings shall prove significant

in preparing the students of Dubai for a technologically advanced future so that they will be able to cope up effectively with the changes.

### **1.3 Research Aim and Objectives**

The study aims to find out the significance of leadership style and effectiveness in exploring STEM skills among talented school students.

The research objectives are:-

- To find out how is leadership style related to leadership effectiveness
- To recognize the impact of leadership effectiveness on school students
- To understand the impact of STEM skill identification on the students in Dubai

**Guaranteed Grades - Projectsdeal.co.uk**

## 2. LITERATURE REVIEW

### 2.1. Scholarly Review

#### 2.1.1. Most Effective Leadership Styles In School Settings And Challenges

This section of the literature review chapter intends to understand the effectiveness of different leadership styles on the performance of students in a classroom setting. Three leadership styles were chosen for the purpose, namely, democratic leadership style, transformational leadership style and situational leadership. The effectiveness of these leadership styles on student's learning outcomes was critically analyzed by reviewing relevant literary sources. The challenges of implementing these styles were also accessed.

Education is an important driver of social progress through an enhanced level of mass awareness (Pérez *et al.*, 2019). The leadership style is among the most important factors that influence the quality of education that will be imparted to the students and the quality of their learning outcomes (Baptiste, 2019; Pérez *et al.*, 2019). While various empirical sources establish the effectiveness of leadership style on the quality of student learning, the following studies are most significant for this study. A study conducted by (Hawkinson, 2016) shows that situational leadership has a significant impact on the quality of team teaching outcomes. The reason is teachers who practice situational leadership style try to understand the social dynamics at play in a particular teaching-learning session. Hence, they try to analyze the situation where they teach and how the knowledge and information shared by them in the school setting can impact the learning behaviour of the students as well as other teachers in and outside a particular classroom setting. This results in the development of a better teaching-learning framework where teachers are able to better understand the implication of the teaching on the students. A similar argument has been presented in the study (Butaney, 2015) which shows that there is an immense improvement in student learning when leaders use situational leadership. The reason, the study furnishes that situational leaders focus on the relationship of teacher-student in a teaching-learning session. They always try to make the relationship between teachers and students supportive and cooperative so that the students develop positive perceptions about the teacher and the information that is being shared. Moreover, the teachers practising situational leadership

style also analyse the manner in which they are instructing the students. They always focus on task-oriented instructions so that the teaching objective is appropriately achieved. Hence, this leadership style is capable of enhancing the quality of student learning (Butaney, 2015). However, one of the challenges of the situational leadership style is that it is most suited for achieving short-term goals, and the long-term goals are often overlooked. Moreover, the success of this leadership style is most dependent upon the role of the leader. If the leader changes the leadership approach constantly, it may lead to confusion (Reed, 2021; Zohair *et al.*, 2021).

Again, the study of (Okoroji, Anyanwu and Ukpere, 2014) indicates that the performance of students improves when teachers use a democratic leadership style. Democratic leadership also advocates the development of a positive teacher-student relationship in teaching and learning processes. These teachers also encourage class participation in decision-making processes related to the teaching-learning session. This approach enhances the motivation of the students and their sense of belongingness because students feel that they are considered worthy in terms of classroom success. Even the study of (Raupu *et al.*, 2021) confirms that the democratic leadership style of the teacher acts as a stimulator that inspires and motivates the followers and **Guarantees** **the** **success** **of** **the** **students** **in** **the** **classroom** **and** **in** **the** **learning** **process**. Even the study of (Ukamaka Akudo, 2020) indicates that the democratic leadership style proves extremely effective for the students because they are given the opportunity to participate in the running affairs of their academic institution. The participation of the students is also sought in the cases of policy formulation and implementation in their schools. These create significant positive changes in the educational achievements of the students (Ukamaka Akudo, 2020). However, the problem with democratic leadership is that it may not be useful when immediate decisions have to be made since it encourages the participation of all people in the decision-making process. Moreover, students can misunderstand the positive notion of freedom and raise resistance if any educational policies or practices do not appeal to them (Morrison, 2008; Moneva, Patrick and Pedrano, 2020).

From the study of (Smith *et al.*, 2017), it is further understood that the transformational leadership style is particularly effective in improving learning outcomes in specific academic settings. The reason is transformational leaders create mutually empowering for themselves and their followers through shared values, charismatic actions and motivations. Thus, this leadership

style contributes towards improving the awareness of the shared values among the followers on one hand, on the other hand, it enhances the overall vision of the organization towards the needs of the followers. This finding has also been agreed in the study (Unamba and Ofoegbu, 2019) which shows that there is a positive relationship between transformational leadership style on the school teachers on the learning culture of the school. This leadership style also enhances organizational commitment and belief, which, in turn, increases the interest of the students towards higher performance. This results in improved academic achievement and discipline among the students. However, one challenge of the transformational leadership style is that since the transformational leaders focus on motivating others, their susceptibility to deviate from their objectives is maximum. Moreover, since they have an immense influence on their followers so they might develop the tendency to misuse their power and negatively motivate them (Saxena *et al.*, 2019).

### 2.1.2 Leadership Styles Mostly In Practice In The Schools Of Dubai

In this section of the chapter, the most commonly followed leadership style in the schools of Dubai was explored. Additionally, the impact of such leadership style on the students was also accessed by making a critical analysis of relevant literary sources.

There is a significant relationship between the leadership style of the teacher and school performance. In this context, the study of (Ukamaka Akudo, 2020) presents that the teaching staff in the schools of Dubai follow either of the leadership styles, namely, transformational. Transactional or avoidant leadership. However, the influx of teachers and consultants from the West in the schools of Dubai brought considerable expertise that helped the majority of the teachers in Dubai adopt the transformational leadership style. The characteristic feature that these leaders exhibit include positive influence, motivation, individualized attention and intellectual stimulation. The students of these schools where transformational leadership is practised also exhibited greater engagement, greater satisfaction and greater learning achievement. Hence, the use of transformational leadership by the teachers in the schools of Dubai has resulted in overall improvement of the school's performance. Even the study (Aldhaheri, 2021) also shows that the leadership style deployed by the teachers affects the quality of learning of the students studying in it. The students perceive the teaching and learning environment of such classrooms as more accommodative and supportive. Hence, their

belongingness to the teaching and learning environment improves and they work towards the accomplishment of their learning objectives more painstakingly. This makes them better learners. However, the study (Aldhaheri, 2021) also found that many schools in Dubai also follow a transactional or laissez-faire style of leadership. Nevertheless, the impact of these leadership styles on the quality of learning of the students is much inferior as compared to that of the schools where transactional leadership style is deployed by the teachers. Even then, no conclusive evidence could be found on the presence of a standardized leadership style in the schools of Dubai. Another study by (Litz and Scott, 2017) shows that the transformational leadership style is most practised in the schools of the United Arab Emirates because a positive link between this leadership style and the effectiveness of the teachers in implementing positive reforms in the schools has been found. It has also been found that the transformational leadership style is more effective in rendering effective student learning outcomes. However, the cultural perceptions of the teachers and principals of the schools in the UAE and the Islamic orientation of the population of the country often create variations in terms of the application of the leadership style. Hence, no standardized leadership style exists in the schools of Dubai till now.

So, the study proposed that a Modified Transformational Model that amalgams transformational leadership style with the cultural beliefs of the teachers, principles and population of Dubai would be most effective. Even the study (Alhammadi, 2019) affirmed that school leaders in Dubai use both transactional and transformational leadership styles. But the study also reported that evidence could not be used on the use of a laissez-faire leadership style. The study also found that while the school principals and male teachers in Dubai favour the use of transformational leadership style, women teachers have the most preference for transactional leadership. The study asserted that the influence of culture, tradition and gender effect on the choice of leadership style among the teachers in the schools of Dubai is most profound.

### 2.1.3. The implication of STEM education in the schools of Gulf Countries

The critical role of Science, Technology, Engineering, and Mathematics (STEM) education in the Gulf Countries was studied by (Kayan-Fadlelmula *et al.*, 2022). The study showed that STEM Education has a significant role in developing human capital. This, in turn, contributes towards improving the competitiveness of the nation and enhancing its prosperity. Therefore, an increased need has been felt in the Gulf Countries to encourage STEM education so that current

and future needs of the labour market could be effectively met. A similar study conducted by (Madani, 2020) shows that in Saudi Arabia, STEM education is considered a key factor that facilitates the financial and social growth of the country. The findings show that there is a positive connection between the encouragement of Science, Technology, Engineering, and Mathematics (STEM) education and the improvement of knowledge and skills of the students. Again, the study of (Ramakrishnan and Abukari, 2020) talks about the significance of distributed leadership on the students of UAE. In so doing, the study indicates that distributive leadership helps in increasing the sustainable development of students by improving the teacher-student relationship.

## **2.2. Literature Gap**

A gap has been identified in the literature here which indicates that no sources could be found that indicate the use of a specific leadership style in the schools of Dubai. However, a preference for a transformational leadership style is mostly observed. Even then, the impact of gender and gender-based perspectives is strong here which determines the type of leadership style that will be taken up by the teachers in the schools of Dubai.

**Guaranteed Grades - Projectsdeal.co.uk**

Again, while working on the leadership style followed by the schools of STEM education, another literature gap was identified. It was further found that literature is scarce on a fixed type of leadership style that is followed in the schools of Dubai so that the learning outcome of STEM subjects could be maximized. The reason is that STEM education is in the nascent stages in the country and its full-fledged implementation in the school has not yet started.

## **2.3. Theoretical framework**

The theoretical framework of this study was framed based on the secondary information that was collected in context to the effectiveness and challenges of different leadership styles in classroom settings and most practised leadership styles in the schools of Dubai.

### **2.3.1. Theory of Transformation**

Theory of Transformation or Transformational leadership theory talks of the leadership style in which the leader keeps organizational goals ahead of their personal interests. They believe in

working with others. Hence, they are inspiring and creative and influence the followers to be innovative and explore their potential (Howarth and Rafferty, 2017; Frederico, 2021).

### **2.2.2. Distributed Leadership Theory**

In the distributed leadership style, the leader believes in a shared management style. Since they are outcome-oriented so they share their knowledge to bring about a breakthrough change. Their approach of widely sharing knowledge garners significant quality improvement in learning and of the followers (García Torres, 2019).

### **2.2.3. Responsible Leadership Theory**

A responsible leader is driven by an ethical and value-based approach. They are responsible, flexible and listen to their followers. They are open to learning and always analyse the impact of their decision on others (Han, Wang and Yan, 2019).

## **2.4. Research Questions Guaranteed Grades - Projectsdeal.co.uk**

From the study conducted so far, the effectiveness and challenges of different leadership styles in a school setting were understood. The study also understood that the schools of Dubai have a positive belief regarding the effectiveness of transformational leadership, but it is still not a standardized approach due to cultural, traditional and gender-related factors. Again, it was found that the schools of Dubai understand the need for integrating STEM education for meeting the future needs of the technologically advanced world. But it has still not been implemented across the schools of Dubai. Based on the information collected so far, the following questions have been developed:

- Q.1. What is the impact of STEM skill identification on the students in Dubai?
- Q.2. What are the challenges of integrating STEM education in the schools of Dubai?
- Q.3. Which leadership style is appropriate for rendering STEM education in the schools of Dubai?

### **3. METHODOLOGY**

#### **3.1. Research Philosophy**

This study shall implement the interpretivist research philosophy where the empirically established theories related to the research problem are cross-checked with case-specific primary findings to generate the answers that are most suitable to the developed research questions (The University of Sydney, 2016; Suhendi and Purwarno, 2018). Therefore, in this case, both the primary and secondary data will be considered to understand the condition of STEM education in Dubai, how the schools are preparing themselves to explore the science talents in their schools and what leadership styles they consider best for integrating STEM education with general education from the school level so that the optimum learning outcome could be achieved.

#### **3.2. Research Design**

The research strategy for the study will be a survey-based interview in which the survey will be conducted on a sampled set of respondents and the responses for further interpretation. Since this will be mixed research the primary data that will be collected shall be numeric so that they can be statistically interpreted. Since the study will intend to collect both qualitative and quantitative data so the secondary information collected from the literature review will provide the necessary abstract data.

#### **3.3. Data Collection Protocol**

For the collection of secondary data, peer-reviewed sources such as academically acknowledged journals, books and articles will be considered. In addition, data references will also be taken from peer-reviewed newspaper and magazine articles, government publications and reports published on empirically established official websites. Certain inclusion and exclusion criteria will be maintained for collecting secondary data which includes the date of publication, nature of source and relevancy of the information for the present study. So, a keyword/key phrase-based search will be conducted for finding the most appropriate sources. Some of the keywords/key phrases that will be used are STEM education, STEM education in Dubai schools, leadership style in Dubai schools, etc.

For primary data collection, a sampling plan will be made. In this, a sample size of 100 teachers from 50 selected private and public schools will be interviewed. This survey-based interview shall intend to understand their specific leadership styles and their significance in the identity of STEM talents among the students of these schools. The non-probability sampling method will be used where respondents with the most likelihood of matching the targeted population of teachers in the schools of Dubai will be chosen.

### **3.4 Data Collection Instrument**

An interview questionnaire will be used as the data collection instrument. The questionnaire will comprise ten questions that cater to various aspects of the research question. The questions will be close-ended in nature and the responses will be in the form of yes/no. Before finalizing the questionnaire, a pilot run shall be conducted where a questionnaire will be distributed among 10 members from the sampled population to accessing how well they have understood the questions, how conveniently they are answering them and the relevance of the feedback with the research aim and objectives.

### **3.4. Data Analysis Procedure** *Guaranteed Grades - Projectsdeal.co.uk*

Since quantitative data will be collected, so statistical software SPSS will be used for interpreting them.

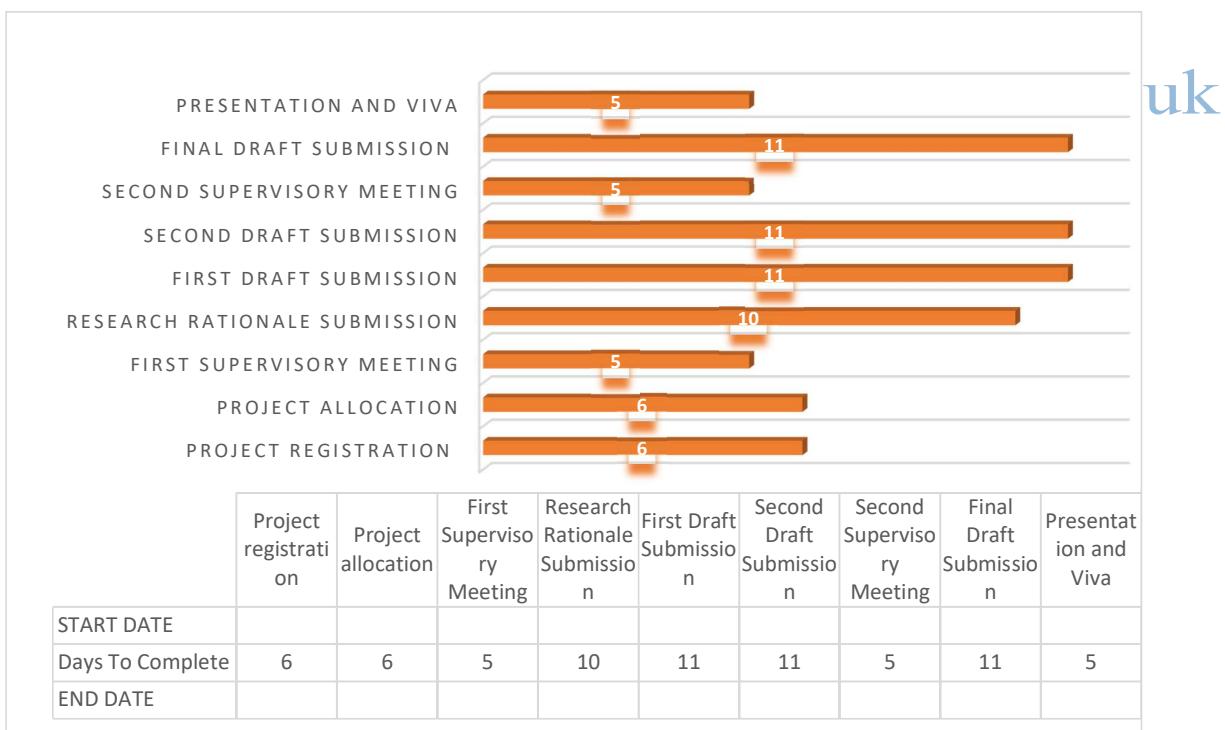
### **3.5. Ethical Consideration**

Ethical considerations form will be circulated among the respondents which they will be asked to read thoroughly and send back as confirmation of their willful participation in the survey. A confidentiality form will also be circulated in addition that will affirm the confidentiality of the identity of the respondents and their feedback. A preamble will also be circulated among the selected respondents before the interview where the purpose of the interview and the objectives that are expected to be achieved will be clearly explained.

For ethical consideration of secondary data, in-text referencing will be given for all the quotes that are used in the study. Along with this, a detailed bibliography will be presented. The specifications of Harvard Referencing Style will be used.

#### 4. Project Outline

GANTT Chart			
TASK	START DATE	END DATE	Days To Complete
Project registration			6
Project allocation			6
First Supervisory Meeting			5
Research Rationale Submission			10
First Draft Submission			11
Second Draft Submission			11
Second Supervisory Meeting			5
Final Draft Submission			11
Presentation and Viva			5



## 5. References

Aldhaheri, A. (2021) 'Do school leaders in the Emirate of Abu Dhabi predominantly', *International Journal of Organizational Analysis* [Preprint].

Alhammadi, M.A.M.A. (2019) *Gender effects on leadership styles in public schools in Abu Dhabi*.

Azar, A.S. and Adnan, E.J. (2020) 'The Impact of Effective Educational Leadership on School Students' Performance in Malaysia May 2020', *Education Quarterly Reviews*, 3(2).

Baptiste, M. (2019) 'No Teacher Left Behind: The Impact of Principal Leadership Styles on Teacher Job Satisfaction and Student Success.', *Journal of International Education and Leadership*, 9(1). Available at: <http://www.jielusa.org/> (Accessed: 16 January 2023).

Butaney, G.T. (2015) 'Examining the association between instructor leadership styles and student learning in marketing courses', in *Proceedings of the 1997 Academy of Marketing Science (AMS) Annual Conference*. Springer Chum.

Chin, R.J. (2015) 'Examining teamwork and leadership in the fields of public administration, leadership, and management', *Team Performance Management*, 21(3–4), pp. 199–216. doi:10.1108/TPM-07-2014-0037/FULL/XML.

Frederico, G.F. (2021) 'Towards a Supply Chain 4.0 on the post-COVID-19 pandemic: a conceptual and strategic discussion for more resilient supply chains', *Rajagiri Management Journal*, 15(2), pp. 94–104. doi:10.1108/RAMJ-08-2020-0047.

García Torres, D. (2019) 'Distributed leadership, professional collaboration, and teachers' job satisfaction in U.S. schools', *Teaching and Teacher Education*, 79, pp. 111–123. doi:10.1016/J.TATE.2018.12.001.

Gratacos, G., Ladron de Guevara, B. and Rodriguez, I. (2021) 'A Study of Teacher Leadership Concept in Institutional Documents in Spain', *Research in Educational Administration & Leadership*, 6(1).

Han, Z., Wang, Q. and Yan, X. (2019) 'How Responsible Leadership Motivates Employees to Engage in Organizational Citizenship Behavior for the Environment: A Double-Mediation Model', *Sustainability 2019, Vol. 11, Page 605*, 11(3), p. 605. doi:10.3390/SU11030605.

Hawkinson, E. (2016) 'Team teaching and situational leadership theory: Adapting and combining frameworks for Japanese English Education', *US-China Education Review*, 6(3).

Howarth, M.D. and Rafferty, A.E. (2017) 'TRANSFORMATIONAL LEADERSHIP AND ORGANIZATIONAL CHANGE: THE IMPACT OF VISION CONTENT AND DELIVERY', in *Academy of Management Proceedings*. Academy of Management Briarcliff Manor, NY 10510. doi:10.5465/AMBPP.2009.44243043.

John, V.K. and Manoj Mechankara, V. (2018) 'STEM: a study in the schools of Dubai, UAE', in *Proceedings of 8th International Conference on Education and eLearning (EeL 2018)*.

Kayan-Fadlelmula, F. *et al.* (2022) 'A systematic review of STEM education research in the

GCC countries: trends, gaps and barriers', *International Journal of STEM Education*, 9(1), pp. 1–24. doi:10.1186/S40594-021-00319-7/FIGURES/14.

Klingborg, D.J., Moore, D.A. and Varea-Hammond, S. (2006) 'What is leadership?', *Journal of Veterinary Medical Education*, 33(2).

Litz, D. and Scott, S. (2017) 'Transformational leadership in the educational system of the United Arab Emirates', *Educational Management Administration & Leadership*, 45(4), pp. 566–587. doi:10.1177/1741143216636112.

Madani, R.A. (2020) 'Teaching Challenges and Perceptions on STEM Implementation for Schools in Saudi Arabia', *European Journal of STEM Education*, 2020(1), p. 3. doi:10.20897/ejsteme/8468.

Moneva, J.C., Patrick, J. and Pedrano, M. (2020) 'Democratic Leadership and Attitude towards Time Management of the Student Leaders', *International Journal of Learning and Development*, 10(1). doi:10.5296/ijld.v10i1.16662.

Morrison, K.A. (2008) *Democratic Classrooms: Promises and Challenges of Student Voice and Choice, Part One*.

Al Murshidi, G. (2019) 'Stem education in the United Arab Emirates: Challenges and possibilities', *International Journal of Learning, Teaching and Educational Research*, 18(12).

Okoroji, L.I., Anyanwu, O.J. and Ukpere, W.I. (2014) 'Impact of leadership styles on teaching and learning process in Imo State', *Mediterranean Journal of Social Sciences*, 5(4).

Palomares, M.P.H., González, M.R. and Fernández, C.J. (2022) 'STEM talent in k-10: a systematic review', *Revista de Educación*, 396.

Pérez, D.R. *et al.* (2019) 'Restoration of Society-Nature Relationship Based on Education: A Model and Progress in Patagonian Drylands', *Ecological Restoration*, 37(3), pp. 182–191. doi:10.3368/ER.37.3.182.

Rahman, M.A. (2012) 'A Comprehensive Model of 21st Century Leadership', *Bangladesh Journal of MIS, Department of Management Information Systems (MIS)*, 2(3). Available at: [https://www.researchgate.net/publication/257351407\\_A\\_Comprehensive\\_Model\\_of\\_21st\\_Century\\_Leadership](https://www.researchgate.net/publication/257351407_A_Comprehensive_Model_of_21st_Century_Leadership) (Accessed: 19 January 2023).

Ramakrishnan, S. and Abukari, A. (2020) 'Distributed leadership in higher education: an analysis of heads of departments' leadership practice in the UAE', *Journal for Researching Education Practice and Theory (JREPT)*, 3(1).

Raupu, S. *et al.* (2021) 'Democratic Leadership and Its Impact on Teacher Performance', *Al-Ishlah: Jurnal Pendidikan*, 13(3).

Reed, R. (2021) 'Higher Education Administrator Turnover: An Examination of Situational Leadership Styles', *College & University*, 96(1). Available at: <https://web.p.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=00100889&AN=148995651&h=tZjJ9m1ySvGb7PMVWxjPHKW9By4F7JUYj2dqSfHXIW%2B5SLfEbWagNrQNbm9pY7EUnIENsRt7swg8wssZ8fog%2Fw%3D%3D&crl=c&resultNs=AdminWebAuth&resultLoca> (Accessed: 23 January 2023).

Saxena, A. *et al.* (2019) 'Power and physician leadership', *BMJ Leader*, 0, pp. 1–7. doi:10.1136/leader-2019-000139.

Schiliro, D. (2013) 'Diversification and development of the UAE's economy', *Diversification and development of the UAE's economy* [Preprint].

Smith, G. *et al.* (2017) 'Successful Instructional Leadership Styles in Education', *Journal of Instructional Research*, 6.

Srikoom, W. *et al.* (2018) 'Dimensions of Effective STEM Integrated Teaching Practice', *K-12 STEM Education*, 4(2), pp. 313–330. Available at: <https://www.learntechlib.org/p/209577/> (Accessed: 18 January 2023).

Suhendi, A. and Purwano (2018) 'Constructivist Learning Theory: The Contribution to Foreign Language Learning and Teaching', *AICLL* [Preprint].

The University of Sydney (2016) *The University of Sydney Faculty of Education and Social Work*. Available at: [http://sydney.edu.au/education\\_social\\_work/learning\\_teaching/ict/theory/constructivism.shtml](http://sydney.edu.au/education_social_work/learning_teaching/ict/theory/constructivism.shtml).

Ukamaka Akudo, F. (2020) 'Perceived Impact of Democratic Leadership Style of Principals on Students' Academic Achievement', *International Journal of Innovative Science and Research Technology*, 5(6). Available at: [www.ijisrt.com](http://www.ijisrt.com) (Accessed: 23 January 2023).

Unamba, E.C. and Ofoegbu, J. (2019) *Impact of Transformational Leadership Style on Students Discipline and Academic Achievement in Mathematics for National Security*, Arvan Ikoku College Of Education.

WEF (2016) *The Human Capital Report, 2016*, World Economic Forum. Available at: <https://www.weforum.org/reports/thehuman-capital-report-2016> (Accessed: 20 January 2023).

Western, S. (2019) *Leadership: A critical text*. Sage.

Zohair, A.Z.H. *et al.* (2021) 'High School Principals' Situational Leadership and Its Relationship with Teachers' Achievement Motivation', *European Journal of Contemporary Education*, 10(4), pp. 1027–1041. doi:10.13187/EJCED.2021.4.1027.