The Medical School Learning Environment's Influence on Goal Orientation

THE MEDICAL SCHOOL LEARNING ENVIRONMENT'S INFLUENCE ON GOAL ORIENTATION

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Abstract

The medical school learning environment (MSLE) influences students experience, academic attainment, and trainees' outcome. [1] Academic performance is influenced by emotions and motivations [2]. Hence, MSLE Survey, [3] is widely used for research and institutional quality assessments. It is probable that the learning environment (LE) impacts medical student goal orientation. Goal orientation takes two dispositions: pursuing competency 'Learning goal orientation' or pursuing favorable judgment 'Performance goal orientation'. [4] We aimed to study MSLE and its influence on goal orientation among medical students (year 1-year 6).

Participants included medical students at the College of Medicine and Health Sciences, United Arab Emirates (UAE) University. Students were grouped into four: Year 1, Year 2, Year 3 & 4, Year 5 & 6. Student demographics along with MSLE and goal orientation questionnaires were collected using an online survey after piloting. Exploratory Factor Analysis (EFA) assessed the latent factor structure of questionnaires. Reliability was measured using Cronbach's alpha. A single factor ANOVA tested the significance of the LE and goal orientation across different groups. Pearson's correlation analysis assessed the association between LE and goal orientation. All statistical tests performed at .05 level of significance.

Medical students (n=377) completed the MSLE and goal orientation questionnaires along with demographic data. The EFA of LE scale revealed four-factors: - (i) Learning

Experiences (∝=0.71), (ii) Students-Student Interaction (∝=0.69), (iii) Students-Faculty Interaction (∝=0.62), and (iv) Academic Support (∝=0.62). Learning experiences for Y3-Y6 are significantly lower than Y1 and Y2. Students-student interaction for Y2 is significantly lower than other years. Students-faculty interaction for Y1 is significantly higher than Y2. Academic support was significantly higher in Y1 compared with Y1-Y6. The EFA of the goal orientation scale revealed three factors (i) learning goal orientation (∝=0.86), (ii) performance goal orientation-prove (∝=0.83), and (iii) performance goal orientation-avoid (∝=0.69). Results of the ANOVA test indicated no significant difference in all three dimensions of goal orientation between the different groups. A positive correlation existed between (i) Learning goal orientation with both learning experience and students-student interaction. (ii) Performance goal orientation-prove with learning experience. A negative correlation existed between Performance goal orientation-avoid with students-faculty interaction.

In conclusion, this is the first study providing psychometric evidence of MSLE and goal orientation in the UAE. Our findings indicate that better learning experiences and students-student interactions have positive impact on LE. Therefore, medical schools are advised to consider enhancing student-to-student interactions and facilitating their learning experiences.

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Chapter 1: Background

The environment is a vital component of our learning experience. In medicine, it influences academic attainment and short and long term trainees outcomes.[1] Learning environments also impact physicians' behavior in medicine.[5] Consistently, in the direction of '*institutional good educational practices*,' assessing the 'medical school's learning environment' is a prerequisite for evaluating curricular improvement.[6,7]

Several studies have investigated the learning environment and its influence on students in the Arabian Gulf Region.[7-10] To our knowledge, the 'medical school learning environment' has not been investigated in the United Arab Emirates (UAE) University setting. Given that this is an essential determinant of student academic success and may differ significantly between medical schools,[9,11] we intend to study the learning environment in the College of Medicine and Health Sciences (CMHS)-UAE University. This research will aid our understanding of the changes needed to improve the learning environment and will serve as a part of the curriculum redesign needs assessment and thereby enhance medical education in the UAE University.

There are several definitions of the learning environment (LE). Dr. H. Rudolf Moos defined it as the "dynamic social system that includes not only teacher behavior and teacher-student interaction, but student-student interaction as well".[12] Astin and Holland identified a college environment, as a product of the number of students, their levels of intelligence, and their types of personality.[13] Collins et al., considered it as the 'total learning activities that took place inside and outside the school'.[14] These definitions could be related to the ways the LE was assessed in different educational settings.[15,16] Nevertheless, common variables among these definitions include the '*social universe*' and the '*students' attributes*'.

Several tools have been used to assess the LE in medical education. Commonly used tools are the Medical School Learning Environment Survey (MSLES),[17] Dundee Ready Education Environment Measure (DREEM),[18] and Johns Hopkins Learning Environment Scale (JHLES).[19]

MSLES was developed by Dr. Ruth E. Marshal in 1978,[20] since then, it has been widely used for both research and institutional quality assessments. The tool was originally developed to assess students' perception of the learning environment. Subsequently, it was modified by Feletti and Clarke in 1981, to include 55 items in the following seven scales: (1) Medical and Personal Breadth of Interest, (2) Emotional Climate, (3) Flexibility, (4) Meaningful Learning Experience, (5) Organization, (6) Nurturance, and (7) Student-Student Interaction.[17]

DREEM was developed by Dr. Sue Roff in 1997.[18] JHLES was developed by Dr. Shochet and his colleagues at Johns Hopkins University School of Medicine in 2015.[19] Thus, MSLES is the oldest medical school learning environment assessment tool when compared to DREEM and Unlike DREEM or JHLES, MSLES has a known validity evidence in various cultures,[21] and has been shown to be sensitive when compared to other tool.[21] MSLES significantly differentiated students perception of the learning environment at different medical school using either traditional and innovative curriculum.[6] Overall, MSLES has a reliability of 0.95,[20] and a test retest reliability of 0.75.[17] Thus, MSLES [3] will be used here as the assessment tool for our medical school learning environment.

Learning environment influences the medical student experience in terms of performance [22], satisfaction,[15] and burnout.[16,23] Academic performance is influenced by emotions and motivations.[2] Thus, it is probable that the learning environment impacts medical student goal orientation.

The goal orientation model was developed by Dweck and Elliot (1983) [24] and Dweck and Leggett (1988) [25] and it was applied on school and college students, with goal as a central construct in this motivational model. And the pursuit of the goals can take two dispositions: pursuing competency **'Learning goal orientation'** or pursuing favorable judgment **'Performance goal orientation'** (the effort used to avoid a negative judgment).[4] Therefore, people with performance goal orientation desire to receive positive feedback and evaluation. On the contrary, people with learning goal orientation believe that abilities are changeable, and effort will affect outcomes. And medical school requires learning environments that promote a learning goal orientation among medical student, to support self-regulated learning skills and lifelong learning behaviours.[26,27]

Student goal orientation has been studied in several cultures and educational settings[28-30]. It is influenced by gender and cultural variation.[28,31] It also correlates with achievement-related behaviors.[32,33]

Studies on the relationship between goal orientation and learning environment were performed in school children. Environmental domains, labeled as 'TARGET variables' (task, authority, recognition, grouping, evaluation, and time) were shown to influence goal orientation (adoption versus shift).[32] This relationship, however, has not been previously investigated among students who are enrolled in medical schools. The learning environment and the style of a medical school are likely to impact student goal orientation and achievement. In this study, we will 'measure dimensions of the learning environment' and 'their relationship to student goal orientation' at CMHS-UAE University.

Chapter 2: Methods

2.1 Variables

Student demographics (gender, age, year in medical school, GPA {grade point average} repeated year, possible influence of a relative or close person in the medical field to enroll in the medical school), were collected along with MSLES data and goal orientation questionnaire (see detailed variables of both questionnaires in the Appendix 6.1-6.6).

2.2 Participants

Our population included CMHS medical students (Year 1 through Year 6). And students were grouped according to their level in the medical school into 4 groups; group one: which include year 1 (Y1) students, group two: which include year 2 (Y2) students, group three: which include year 3 (Y3) and year 4 (Y4) students and group four: which include year 5 (Y5) and year 6 (Y6) students. And this grouping years grouping was planned in relation to the system in the CMHS that differentiate the years in medical schools according to the curriculum into three levels:

1. Pre-medical years: Y1 and Y2,
2. Pre-clinical years: Y3 and Y4,
3. Clinical years which are Y5 and Y6.

The Study participation was voluntary. Students were recruited mainly prior or following a scheduled session, by obtaining permission from professors teaching that session. Prior to data collection the research team introduced students to the goals of the study. Signed consent forms were obtained from participants (see appendix 6.7) before sharing the QR code for the questionnaire on Qualtrics. To maximize participation, follow up emails introducing the study, with electronic copies of consent forms and the questionnaire link; were sent to capture

students who missed the class visit. The study was approved by UAE University Social Sciences Ethics Sub-Committee (Ref. N: ERS_2021_7362).

2.3 Research site

This study was conducted at the CMHS in the UAE University. The UAEU is the first national university established and the CMHS is the first and largest college of medicine in the country. The CMHS was established in 1984. The number of enrolled students in each academic year is described in Table 1 below; about 72% of the students are females.

Table 1.
Descriptive summary of the number and gender distribution of enrolled students at the CMHS in the academic year 2021/2022 according to Year in medical school

Year in medical school	Number of students enrolled	(Male: Female)
Y1	146	(51:95)
Y2	137	(35:102)
Y3	76	(23:53)
Y4	69	(13:56)
Y5	84	(21:63)
Y6	72	(18:54)
Total	584	(161:423)

CMHS: College of Medicine and Health Sciences

2.4 Conditions

Medical students were asked to complete the online survey which included MSLES (reflecting on the current and past year experience), goal orientation questionnaire, and demographic questions.

2.5 Instruments

For this study, we used two questionnaires that have been previously used in the literature, with psychometrics characteristics measured at different contexts.

The Medical School Learning Environment Survey (MSLES)[3] (Appendix 6.1)

The modified MSLES uses a five-point Likert scale, where 1 = never, 2 = seldom, 3 = occasionally, 4 = fairly often, and 5 = very often. The seventeen scale items within the MSLES are reported as a mean score of the seventeen scale items and each of the seventeen scale items reported individually in the form of means and standard deviations. The score of survey items 6, 8, 9, 10, 14, 15 and 17 were reverse coded for the analysis as they were expressed negatively. Therefore, In the current format higher values represented a more positive evaluation of the learning environment as the remaining survey items of the MSLES. Permission to use the modified MSLES questionnaire was obtained from Dr. Marcy Rosenbaum (Sahai Family Professor of Medical Education and Professor of Family Medicine, Office of Consultation and Research in Medical Education, University of Iowa Carver College of Medicine)

The goal orientation questionnaire [29] was used to assess medical student goal orientation (Appendix 6.2). Permission to use the goal orientation questionnaire was obtained from Dr. Bill Attenweiler (Associate Professor, Emeritus, Northern Kentucky University). The score

of the individual questions indicates the level of agreement to the statement from 1-7, where 1 indicates strongly disagree, 2 very much disagree, 3 disagree, 4 neutral (neither agree or disagree), 5 agree, 6 agree very much and 7 strongly agree.

2.6 Piloting the survey tool

The MSLES and goal orientation questionnaire were piloted with representative students to the population to determine time required to participate in the survey, as well as to obtain their input on language of the questionnaires. The MSLES and goal orientation questionnaire were piloted on 13 medical students at the CMHS, (5 male students and 8 female students) as highlighted in table 2 below. One to two students from each year had cognitive interview (n=7) and the remaining students (n=6) went through pilot test process as described below.

Table 2.

Descriptive summary of the piloted student's distribution according to the year at medical school, gender and type of piloting (n=13)

Year in medical school	Gender	Type of piloting
Y1	Female	Cognitive interview
Y1	Male	Pilot test
Y2	Female	Pilot test
Y2	Male	Cognitive interview
Y2	Female	Cognitive interview
Y3	Female	Cognitive interview
Y3	Male	Pilot test
Y3	Female	Pilot test
Y3	Male	Pilot test
Y3	Male	Pilot test
Y4	Female	Cognitive interview
Y5	Female	Cognitive interview
Y6	Female	Cognitive interview

During the piloting process using cognitive interview we employed the following steps:

1. Started a recorded zoom meeting one to one with the principal investigator
2. The Qualtrics link was shared with the student during the meeting
3. Student accessed the link and shared the screen with the investigator
4. Student was instructed to read the questions and express their understanding of each question concept and wording by paraphrasing it or giving an example to explain their understanding

During the piloting process using pilot testing we used the following steps:

1. Started a recorded zoom meeting one to one with the principal investigator.
2. The Qualtrics link was shared with the student during the meeting.
3. Student accessed the link and shared the screen with the investigator.
4. Student was instructed to read the questions aloud, answer them and ask the investigator about unclear questions or difficult wording in the questionnaire.

The investigator took notes while conducting the interviews, clarified difficult questions and words, and asked for alternative wording that students understand better than the used ones in the questionnaire. At the end of the piloting process, the interviews recording for all students were revised to ensure that no further changes were need and all students understood the questionnaires correctly. There were some words that were not clear for some students e.g., in the MSLES scale the word seldom was changed to rare. Alternative wording was added between brackets to add clarity to the original questionnaire language. See final version in the appendix 6.3, 6.4, 6.5 and 6.6.

2.7 Data collection

Both learning environment and goal orientation questionnaire data along with the demographic data were collected using the online survey tool (Qualtrics®XM).

2.8 Data analysis

The data were analyzed using STATA® BE version, 17.0. Missing data were checked and replaced using the chain imputation method which is a robust methodology that uses multiple imputation by chained equations to deal with missing data in the dataset, through an iterative series of predictive models. Data imputation was used to avoid any potential bias due to missing data in surveys responses.[34] This method of imputation was used because the it can handle variables of varying types and complexities like survey skip patterns,[35] which is the case with our dataset. The statistical analysis included both descriptive and inferential methods. Categorical variables were presented and summarized using frequency tables and percentages. Interval scaled variables or continuous variables including the aggregated scores of the learning environment and performance goal orientation scales were summarized using means and standard deviations.

Exploratory Factor Analysis (EFA) was used to assess the latent factor structure of the learning environment and performance goal orientation constructs. To extract latent factors, principal components (PC) method was used. PC analysis is a multivariate statistical technique that transforms data from one set of variables into a smaller set of uncorrelated components.[36] The rotation of the factor loadings matrix was performed to produce the final factor matrix indicating items reflecting each latent factor. The main aim of the rotation is to extract a simple interpretable structure and achieve the criterion of "simple structure". There are many rotation procedures including varimax or Promax. The varimax rotation aims to simplify factors internally by maximizing the spread of variance across items and maximizing the difference in loadings between factors. The varimax rotation assumes orthogonality or mutually independence of factors while Promax allows correlated factor structure.[36]

To assess whether an individual item is working well in the factor analysis, communalities, which are estimates of the variance in each variable accounted for by the factors (or components) in the factor solution are used. Hair et al. (2010) classified these loadings as ±0.30=minimal, ±0.40=important, and ±.50=practically significant. Therefore, A minimum cut-off value of 0.5 was used to include the items as a part of the analysis. Namely factorability of 0.5 imply that the factor explain approximately 50% relationship in the data.[37] The appropriateness of factor analysis was checked using Kaiser – Meyer- Olkin (KMO) Measure of Sampling adequacy and Bartlett's test. The KMO measure ranges between 0 and 1 with higher values indicating that patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors. Hair et al. (2010) suggests the use of a minimum of 0.7 as an acceptable lower limit for a satisfactory solution.[36] Bartlett's' test of sphericity tests the null hypotheses that the original correlation matrix is proportional to the identity matrix. For factor analysis to be considered appropriate there is a need for some relationships between variables and the correlation matrix to be a nonidentity matrix. Therefore, for factor analysis to be appropriate, Bartlett's test must be statistically significant ($p < .05$).

The decision on the appropriate number of factors to be extracted is based on two items of minimum eigenvalue for any extracted factor and minimum percentage of variance explained by the data reduction solution. Factors having Eigenvalues greater than one (indicating the factor reflecting explained variance more than what is done by a single item) were considered for common factors. Also, the factor solution must explain a minimum of 60% of the total variance in the original data. Factor loading of a factor with any measured variable in the rotated factor matrix is considered high and significant if it is more than 0.50.

The reliability of the scale was measured using Cronbach's alpha measure of internal consistency and using a cut off of 0.70 to indicate highly satisfactory reliability of the scale.[36]

A single factor ANOVA was used to test the significance of the difference in learning environment dimensions across year groups. The extracted factor structure from EFA was used for correlation and regression analysis to quantify and test the effect of learning environment components on the goal performance orientation of participants. Pearson's correlation analysis was performed to assess pairwise strength of association between learning environment and performance goal orientation.

A general linear model (GLM) was fitted and tested to quantify and test the effect of learning environment components on dimensions of performance goal orientation. The GLM model estimates are considered unbiased and robust when the assumption of constant error variance or homoscedasticity is satisfied.[36] The GLM was fitted and tested using heteroscedastic consistent robust standard errors. The GLM model was fitted and tested to find unadjusted and adjusted model effects controlling for the effect of age group, gender, and year group. All the statistical tests were performed at .05 level of significance.

Chapter 3: Results

Of the eligible 584 students enrolled at the CMHS, UAE University in the academic year 2021/2022 (Table 1), 13 students enrolled in the piloting process (Table 2) and 377 enrolled in the study and completed the MSLES, goal orientation survey and demographic data (Filling the questionnaire lasted approximately ten minutes). The overall study response rate was 69% which was variable between students in different years of medical school (Table 3). A descriptive summary of the student's response to different items of MSLES, goal orientation survey and demographic data (available responses, missing responses, and percentage of missing responses) is summarized in the appendix (6.8, 6.9 and 6.10).

Table 3.

The response rate of enrolled students in the study in relation to the number of students enrolled in the CMHS in the academic 2021/2022

Year in medical school	Response rate
Y1	73 %
Y2	55%
Y3 & Y4	62%
Y5 &Y6	84%
Overall response rate	**69%**

CMHS: College of Medicine and Health Science

3.1 Demographic information

In our sample (*n*=377) females were more than males with the male to female ratio (1:2). The age of enrolled students in the study it was mainly between 17 and 25 years with few students being 26 years or older. The age of Y1 students was mostly between 17 and 18 years, the age of Y2 students was mostly between 19 and 20 years, the age of Y3 and Y4 students was mostly between 21 and 22 years and the age of Y5 and Y6 students was mostly between 22 and 23 years (Table 4).

The average academic performance in the last academic year of students from Y1 to Y6 was 3.4 ± 0.4 and 7.1% of all year's student reported repeated year, with none of Y1 students reported repeated years, 3.1% of Y2 students reported repeated years, 12.7% of Y3 and Y4 students reported repeated years and 11.5% Y5 and Y6 students reported repeated years (The reason of repeated years is highlighted in Appendix 6.11). And about quarter of the students enrolled in the study reported to be inspired to enroll in medical school because of close person or a family member in the medical field (Table 4).

Table 4
Demographic information of the study population (n=377)

	Year in medical school				
	Y1-Y6 (n=377)	**Y1** (n=103)	**Y2** (n=69)	**Y3 & Y4** (n=78)	**Y5 & Y6** (n=127)
Gender, %					
Female	67.9%	62.1%	75.4%	74.4%	64.6%
Male	21.5%	24.3%	17.4%	16.7%	24.4%
Missing	10.6%	13.6%	7.3%	9.0%	11.0%
Age group in years, %					
17-18 years	28.9%	77.7%	42.0%	-	-
19-20 years	14.3%	8.7%	50.7%	12.8%	-
21-22 years	18.8%	-	1.5%	69.2%	12.6%
22-23 years	24.7%	-	-	7.7%	68.5%
24-25 years	2.4%	-	-	-	7.1%
26 years or more	0.5%	-	-	1.3%	0.8%
Missing	10.3%	13.6%	5.8%	9.0%	11.0%
Reported average score in the last academic year[#], mean ± SD	3.4 ± 0.4	3.8 ± 0.1	3.2 ± 0.5	3.3 ± 0.5	3.3 ± 0.4
Reported repeated years, %	7.1%	0%	3.1%	12.7%	11.5%
Reported to be inspired to enroll in medical school because of close person or family member in the medical field, %	23.3%	21.4%	24.6%	29.2%	20.4%

*(%) is calculated from the total number of students in each year
[#]Average score in the last academic year for year 1 students converted from average % score to GPA (Grade Point Average) using the following formula =% score /100 * 4

3.2 Medical school learning environment

Evaluation of the medical school learning environment using the 17 items MSLES measured medical students' perceptions of the learning environment. A summary of the 17 survey items for student in different academic year is summarized in table 5. The reliability of the 17 items scale was measured using Cronbach's alpha measure of internal consistency ($\propto$=0.798) which indicates a high reliability.

Table 5.
Medical School Learning Environment Survey (*MSLES) average scores and scores for each of 17 individual survey items for students from year 1-6 (n=377)*

Survey item* **(∝=0.798)**	**Year in medical school**				
	Y1-Y6 (n=377)	**Y1** (n=103)	**Y2** (n=69)	**Y3 & Y4** (n=78)	**Y5 &Y6** (n=127)
Average MSLES	3.18 ± 0.50	3.49 ± 0.42	3.10 ± 0.52	3.14 ± 0.46	3.00 ± 0.47
1. The environment of the school allows for interests outside of medicine	2.81 ± 1.09	3.19 ± 1.18	2.45 ± 0.95	2.89 ± 1.13	2.65 ± 0.95
2. Upper-level students provide informal guidance to lower-level students.	4.05 ± 1.01	4.29 ± 1.06	3.97 ± 0.99	4.06 ± 0.94	3.90 ± 0.99
3. Students gather together for informal activities	2.92 ± 1.07	2.94 ± 1.15	2.39 ± 1.03	2.99 ± 0.95	3.14 ± 1.00
4. Students in the school get to know each other well	3.59 ± 1.03	3.84 ± 1.03	3.15 ± 1.14	3.59 ± 0.96	3.62 ± 0.94
5. Students spend time assisting each other	3.65 ± 1.00	4.06 ± 0.96	3.33 ± 1.15	3.47 ± 0.86	3.60 ± 0.93
6. Students hesitate to express their opinions and ideas to faculty#	2.76 ± 1.12	3.16 ± 0.98	2.93 ± 1.12	2.80 ± 1.14	2.32 ± 1.08
7. Student complaints are responded to with meaningful action	2.99 ± 1.07	3.82 ± 0.89	2.96 ± 0.96	2.71 ± 1.01	2.51 ± 0.92
8. Students have difficulty finding time for family and friends#	2.24 ± 0.95	2.46 ± 1.04	1.84 ± 0.83	2.30 ± 0.87	2.24 ± 0.94
9. Competition for grades is intense#	2.55 ± 1.18	2.49 ± 1.23	2.72 ± 1.19	2.72 ± 1.13	2.40 ± 1.14
10. The relationship between basic science and clinical material is unclear#	3.47 ± 1.04	3.69 ± 1.11	3.77 ± 0.94	3.53 ± 1.03	3.08 ± 0.94
11. Exams emphasize understanding of concepts	3.61 ± 0.93	4.03 ± 0.86	3.83 ± 0.95	3.39 ± 0.86	3.28 ± 0.85
12. Courses emphasize the interdependence of facts, concepts and principles	3.79 ± 0.80	4.11 ± 0.77	3.91 ± 0.70	3.71 ± 0.72	3.50 ± 0.82
13. Exams provide a fair measure of student achievement	3.15 ± 1.01	3.41 ± 1.05	3.48 ± 0.92	3.00 ± 1.04	2.85 ± 0.90
14. Students in the school are distant with each other#	3.19 ± 0.93	3.33 ± 0.93	2.84 ± 1.04	3.15 ± 0.87	3.28 ± 0.89
15. Faculty are reserved and distant with students#	3.07 ± 1.06	3.42 ± 1.05	2.90 ± 1.27	3.03 ± 0.95	2.91 ± 0.94
16. Faculty, administrators, and staff give personal help to students having academic difficulty	3.36 ± 1.13	4.07 ± 0.92	3.51 ± 1.07	3.03 ± 1.12	2.91 ± 1.02
17. Students are reluctant to share with each other problems they are having#	2.92 ± 1.09	3.02 ± 1.11	2.74 ± 1.18	3.06 ± 1.09	2.85 ± 1.01

* The score of the individual questions indicates the category of frequency that most closely approximates students' perceptions of the learning climate where 1 indicates never, 2 rare, 3 occasionally, 4 fairly often and 6 very often.
# The score of survey items 6, 8, 9, 10, 14, 15 and 17 were reverse coded for the analysis as they were expressed negatively. Therefore, In the current format higher values represented a more positive evaluation as the remaining survey items of the MSLES.

The exploratory factor analysis of the learning environment scale revealed a four-factor structure to be appropriate to reflect the latent factor structure of the learning environment construct. The KMO measure of sampling adequacy was 0.791 and Bartlett's test was significant ($p < .05$), indicating that the factor analysis was appropriate. All the communality values were higher than 0.50.

Figure 1 presents a scree plot of the EFA for the learning environment scale. The scree plot indicated that four factors are adequate to explain the majority of the variance in the learning environment scale. The four factors together accounted for 81.3% of the total variance in the learning environment scale. Furthermore, the Akai's information criterion (AIC) measure, which is a measure of the model parsimony, indicated the lowest value for four factors. Table 6 presents the descriptive summary measures of each of the four factors extracted from the learning environment scale classified by years in medical school. These four factors were respectively labeled and categorized as –

(i) Learning Environment Factor 1 (LEF1): Learning Experiences

(ii) Learning Environment Factor 2 (LEF2): Students to Student Interaction

(iii) Learning Environment Factor 3 (LEF3): Students to Faculty Interaction

(iv) Learning Environment Factor 4 (LEF4): Academic Support

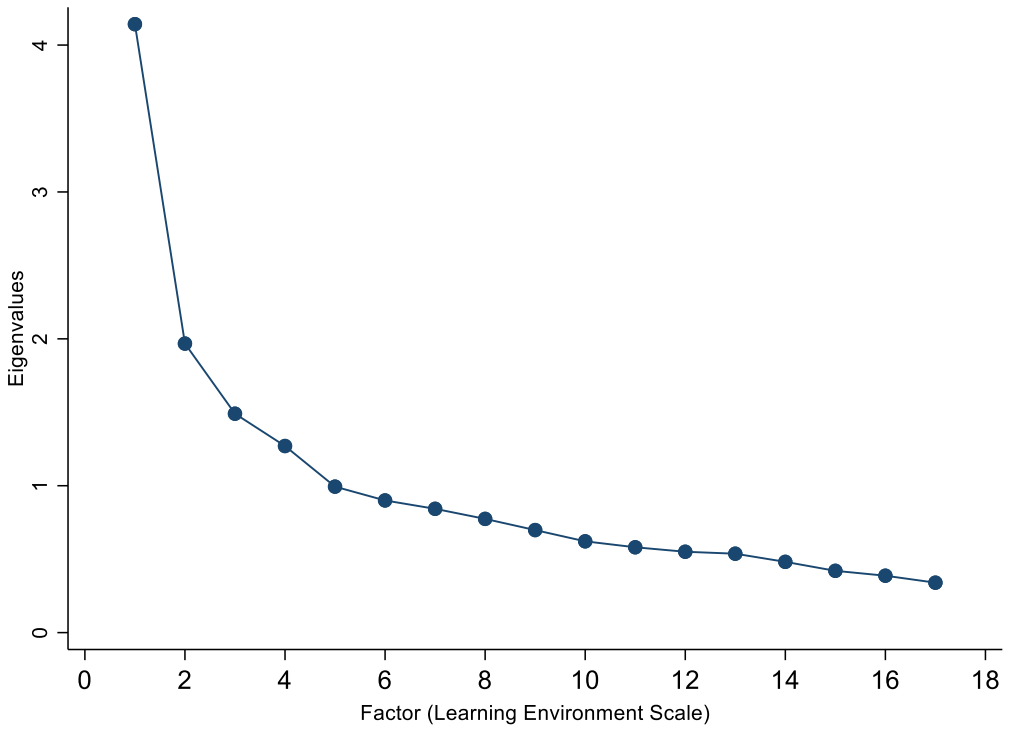

Figure 1. *Scree plot of the exploratory factor analysis of learning environment scale*

Table 6.
The scores of the different component of the learning environment in the different year in medical school (n=377)

	Year in medical school				
	Y1-Y6 (n=377)	**Y1** (n=103)	**Y2** (n=69)	**Y3 & Y4** (n=78)	**Y5 &Y6** (n=127)
Learning Environment Factor 1 (LEF1): Learning Experiences (∝=0.71)	3.50 ± 0.69	3.81 ± 0.64	3.75 ± 0.63	3.40 ± 0.64	3.18 ± 0.65
10. The relationship between basic science and clinical material is unclear[#$].					
11. Exams emphasize understanding of concepts					
12. Courses emphasize the interdependence of facts, concepts and principles					
13. Exams provide a fair measure of student achievement					
Learning Environment Factor 2 (LEF2): Students to Student Interaction (∝=0.69)	3.48 ± 0.67	3.69 ± 0.62	3.14 ± 0.74	3.45 ± 0.62	3.51 ± 0.65
2. Upper-level students provide informal guidance to lower-level students.					
3. Students gather together for informal activities					
4. Students in the school get to know each other well					
5. Students spend time assisting each other					
14. Students in the school are distant with each other[*#]					
Learning Environment Factor 3 (LEF3): Students to Faculty Interaction (∝=0.62)	2.71 ± 0.68	2.91 ± 0.66	2.63 ± 0.78	2.78 ± 0.65	2.55 ± 0.62
6. Students hesitate to express their opinions and ideas to faculty[#]					
8. Students have difficulty finding time for family and friends[#]					
9. Competition for grades is intense[#]					
15. Faculty are reserved and distant with students[#]					
17. Students are reluctant to share with each other problems they are having[#]					
Learning Environment Factor 4 (LEF4): Academic Support (∝=0.62)	3.05 ± 0.83	3.69 ± 0.63	2.97 ± 0.73	2.87 ± 0.81	2.69 ± 0.74
1.The environment of the school allows for interests outside of medicine					
7. Student complaints are responded to with meaningful action					
16. Faculty, administrators, and staff give personal help to students having academic difficulty					

The score of the individual questions indicates the category of frequency that most closely approximates students' perceptions of the learning climate where 1 indicates never, 2 rare, 3 occasionally, 4 fairly often and 6 very often.

[#] The score of survey items 6, 8, 9, 10, 14, 15 and 17 were reverse coded for the analysis as they were expressed negatively. Therefore, In the current format higher values represented a more positive evaluation as the remining survey items of the MSLES.

[$] Question 10 is a negatively worded item, so it's regarded as a meaningful learning experience

*Question 14 is a negatively worded item, so it's regarded as a positive interaction.

A single factor ANOVA was used to test the significance of the difference in learning environment dimensions across year groups. Figure 2 presents a box plot of the learning environment factors across year groups. Results of the ANOVA test indicated a significant difference in learning experiences dimension of the learning environment scale ($F(3, 373) = 22.37$, $p < .001$). Results of the Bonferroni's procedure-based test for post-hoc multiple comparisons indicated that the mean score of learning experiences for students in year groups Y3 & Y4 and Y5 & Y6 are both significantly lower than those in Y1 and Y2.

There was a significant difference in student-student interaction dimension of the learning environment scale ($F(3, 373) = 10.20$, $p < .001$). Results of the Bonferroni's procedure-based test for post-hoc multiple comparisons showed that the mean score of student-student interaction for students in year group Y2 is significantly lower than those in other three year-groups.

There was a significant difference in student-faculty interaction dimension of the learning environment scale ($F(3, 373) = 6.19$, $p < .001$). Results of the Bonferroni's procedure-based test for post-hoc multiple comparisons indicated that the mean score of students- faculty interaction for students in year group Y1 is significantly higher than those in Y2.

There was a significant difference in academic support dimension of the learning environment scale across year groups ($F(3, 373) = 39.25$, $p < .001$). Results of the Bonferroni's test for post-hoc multiple comparisons indicated that the academic support was significantly higher in Y1 as compared with other three-year groups.

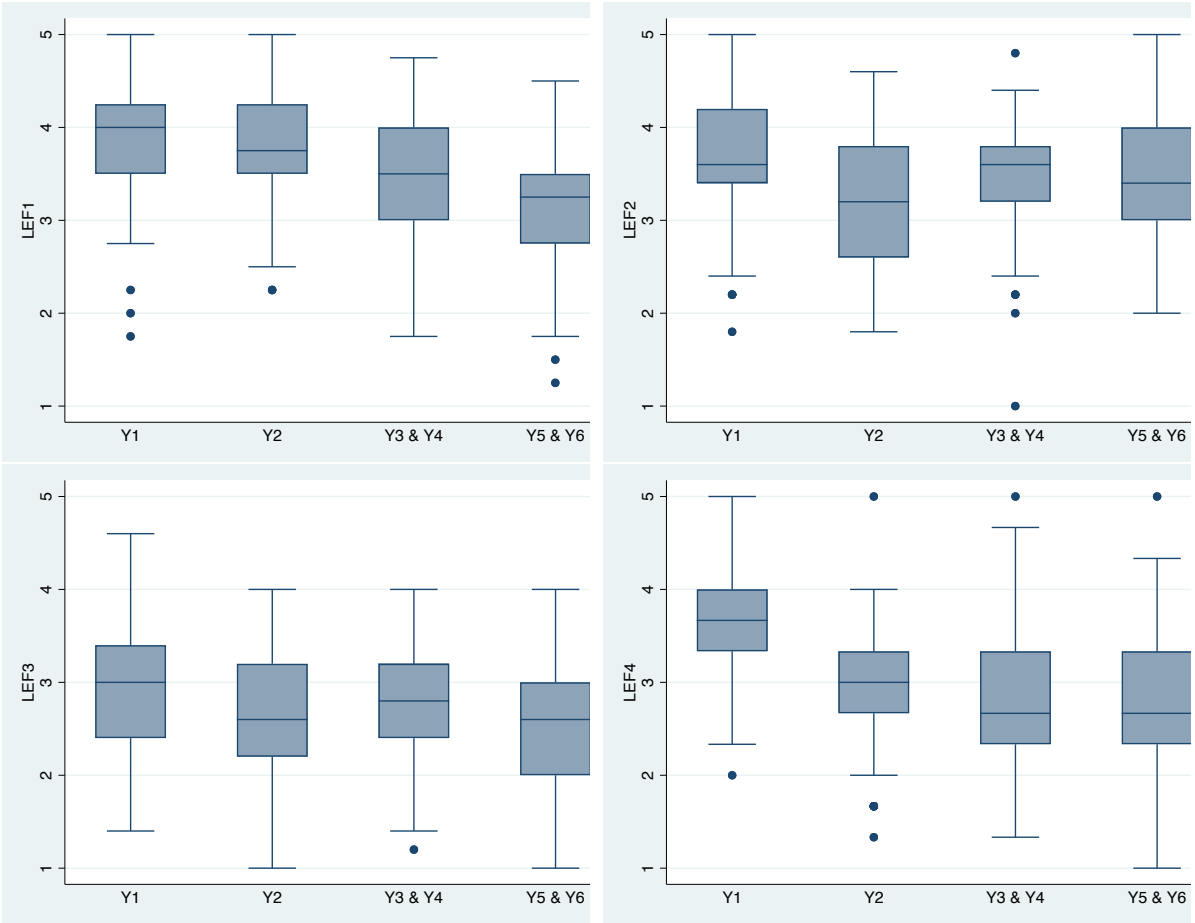

Figure 2. *Box plot of the learning environment factors across year groups.*

LEF1: Learning Environment Factor 1 (Learning Experiences), LEF2: Learning Environment Factor 2 (Students to Student Interaction), LEF3: Learning Environment Factor 3 (Student to Faculty Interaction),

3.3 Goal Orientation

The exploratory factor analysis was performed on each of the three dimensions of the goal orientation – (i) learning goal orientation (LGO), (ii) performance goal orientation - prove (PGOP), and (iii) performance goal orientation – avoid (PGOA).

The KMO measure of sampling adequacy was more than 0.70 for EFA of each component of goal orientation and Bartlett's test was significant ($p < .05$), indicating that the factor analysis was appropriate for each component of the goal orientation construct. The EFA revealed a single factor structure for each component of the outcome variable explaining most of the variance in the construct. Table 7 presents descriptive summary measures of each of the three dimensions of the goal orientation scale classified by years in medical school group.

A single factor ANOVA was carried out to test the significance of the difference in each dimension of goal orientation across year groups. Results of the ANOVA test indicated no significant difference in any of the three dimensions of goal orientation construct ($p > .05$).

Table 7

The scores of the different components of the goal orientation questionnaire in the different years in medical school (n=377)

	Year in medical school				
	Y1-Y6 (n=377)	**Y1** (n=103)	**Y2** (n=69)	**Y3 & Y4** (n=78)	**Y5 &Y6** (n=127)
Learning Goal Orientation (∝=0.862) 1. I enjoy challenging and difficult tasks where I learn new skills. 2. I want to learn as much as possible. 3. The opportunity to learn new skills and knowledge is important to me. 4. I prefer to work on tasks that force me to learn new things. 5. The opportunity to extend the range of my abilities is important to me. 6. I like best when something I learn makes me want to find out more. 7. When I fail to complete a difficult task, I plan to try harder the next time I work on it. 8. The opportunity to learn new things is important to me.	5.83 ± 0.83	5.75 ± 0.76	5.87 ± 0.73	5.91 ± 0.87	5.82 ± 0.92
Performance Goal Orientation – Prove (∝=0.828) 1. I prefer to work on projects in which I can prove my ability to others. 2. I want others to think I am smart. 3. I enjoy proving my ability to others. 4. I am motivated by the thought of outperforming my peers. 5. The opinions of others about how well I do certain things are important to me. 6. I strive to demonstrate my ability relative to others.	4.48 ± 0.83	4.49 ± 1.04	4.57 ± 1.11	4.51 ± 1.09	4.39 ± 1.18
Performance Goal Orientation – Avoid (∝=0.691) 1. The things that I enjoy most are the things I do best. 2. I prefer to do things that I can do well rather than things that I do poorly. 3. I like to work on tasks that I have done well in the past. 4. Because I know my work will be compared to others, I get nervous. 5. My fear of performing poorly is often what motivates me. 6. I prefer to avoid situations in which I might perform poorly. 7. I like to be fairly confident that I can successfully perform a task before I attempt it.	5.13 ± 0.83	5.08 ± 0.78	5.17 ± 0.85	5.22 ± 0.92	5.09 ± 0.80

The score of the individual questions indicates the level of agreement to the statement from 1-7, where 1 indicates strongly disagree, 2 very much disagree, 3 disagree, 4 neutral (neither agree or disagree), 5 agree, 6 agree very much and 7 strongly agree.

The score presented is the average score ± standard deviation in each construct.

3.4 Hypothesis Testing

Figure 3 presents a scatter plot matrix of the learning environment dimensions and goal orientation components. Table 8 presents corresponding correlation matrix of the variables. Learning goal orientation showed a statistically significant positive weak correlation with the first two factors of the learning environment, which are learning experience (n = 377, $r = 0.103$, $p < .05$), and student to student interaction (n = 377, $r = 0.154$, $p < .05$). Performance goal orientation-prove component showed a significant positive weak correlation with the first factor of the learning environment, which is learning experience (n = 377, $r = 0.123$, $p < .05$). Performance goal orientation-avoid component had a significant weak negative correlation with the third factor of learning environment, which is student to faculty interaction (n = 377, $r = -0.153$, $p < .05$).

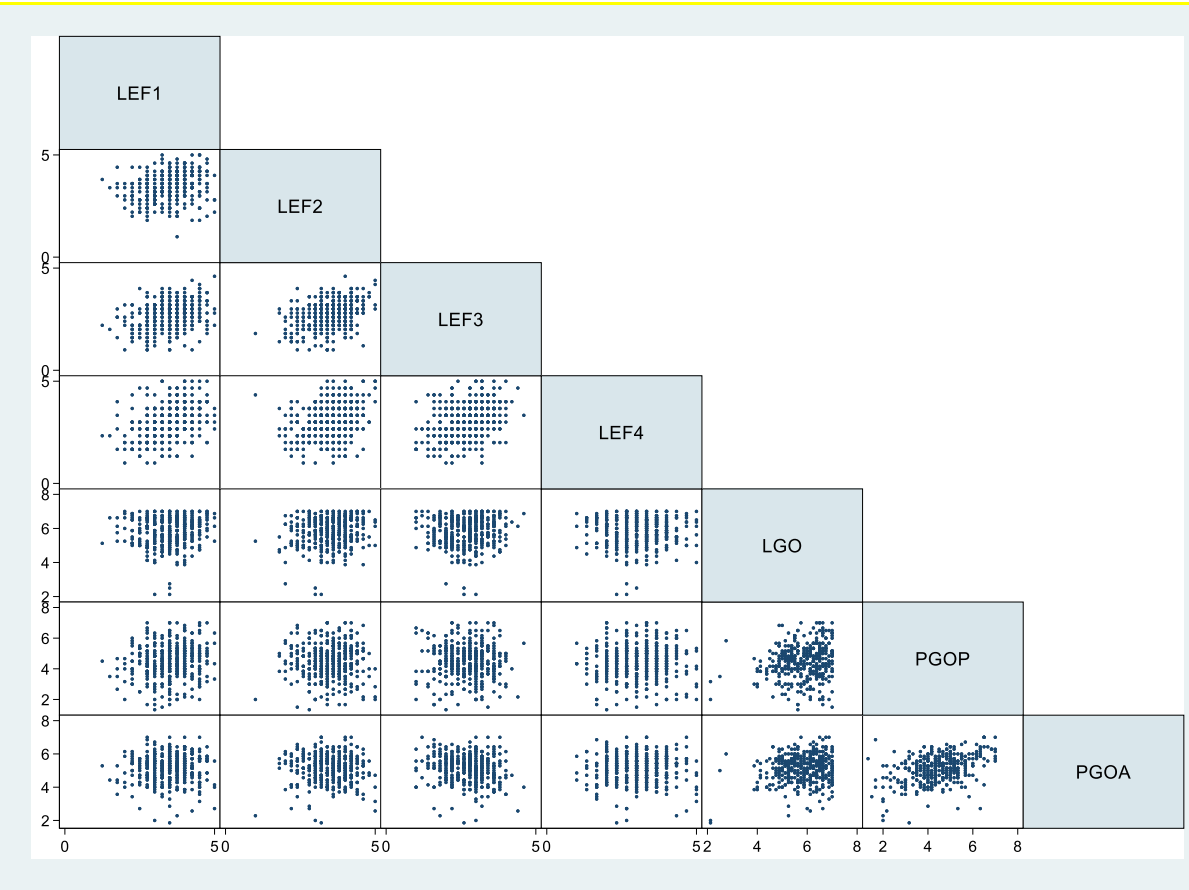

Figure 3. *Scatter plot matrix of the learning environment and goal orientation components*

LEF1: Learning Environment Factor 1 (Learning Experiences), LEF2: Learning Environment Factor 2 (Students to Student Interaction), LEF3: Learning Environment Factor 3 (Student to Faculty Interaction), LEF4: Learning Environment Factor 4 (Academic Support), LGO: Learning Goal Orientation, PGOP: Performance Goal Orientation-Prove, PGOA: Performance Goal Orientation-Avoid

Table 8

Correlation of Learning Environment Dimensions on Goal Orientation

	LEF1	LEF2	LEF3	LEF4	LGO	PGOP	PGOA
LEF1	--						
LEF2	0.246*	--					
LEF3	0.334*	0.392*	--				
LEF4	0.404*	0.293*	0.350*	--			
LGO	0.103*	0.154*	0.069	0.023	--		
PGOP	0.123*	0.002	-0.006	0.024	0.171*	--	
PGOA	0.036	-0.034	-0.153*	0.003	0.0168*	0.414*	--

* Significant at .05 level, n = 377.

LEF1: Learning Environment Factor 1 (Learning Experiences), LEF2: Learning Environment Factor 2 (Students to Student Interaction), LEF3: Learning Environment Factor 3 (Student to Faculty Interaction), LEF4: Learning Environment Factor 4 (Academic Support), LGO: Learning Goal Orientation, PGOP: Performance Goal Orientation-Prove, PGOA: Performance Goal Orientation-Avoid

Table 9 presents unadjusted and adjusted effects of learning environment components and tests for their significance on learning goal orientation. Results of the unadjusted effects model (model 1) showed a significant positive effect of student-to-student interaction dimension of learning environment construct ($\beta = 0.184$, $t = 2.588$, $p = .01$). The effect of learning experience dimension of learning environment construct was marginally significant at $p = .10$ level but not at .05 level of significance ($\beta = 0.107$, $t = 1.659$, $p = .098$). The effect of student-to-student interaction remained positive and statistically significant in the adjusted effect model (model 2), controlling for gender, age group, and study year group ($\beta = 0.244$, $t = 2.847$, $p = .005$). These results indicate that higher levels of student-to-student interaction are associated with a higher level of learning goal orientation.

Table 9
Effect of Learning Environment Dimensions on Learning Goal Orientation

Predictor		(Model 1) LGO	(Model 2) LGO
LEF1		0.107*	0.109
		(0.065)	(0.076)
LEF2		0.184**	0.244***
		(0.071)	(0.086)
LEF3		0.0019	-0.020
		(0.068)	(0.075)
LEF4		-0.058	-0.017
		(0.057)	(0.071)
Gender	Male		a
	Female		0.057
			(0.111)
Age group (years)	17 – 18		a
	19 - 20		0.024
			(0.144)
	21 – 22		-0.131
			(0.218)
	23 – 24		0.157
			(0.329)
	>= 25		0.137
			(0.419)
Year group	1st year		
	2nd year		0.290**
			(0.146)
	3rd and 4th year		0.329*
			(0.196)
	5th and 6th year		0.0768
			(0.327)
Constant		4.989***	4.469***
		(0.279)	(0.402)
Observations		377	337
R-squared		0.031	0.057

Note: LGO = Learning Goal Orientation, Model 1 gives unadjusted and model 2, the adjusted effects.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 presents unadjusted and adjusted effects of learning environment components and tests for their significance on performance goal orientation – prove construct. Results of the unadjusted effects model (model 3) showed a significant positive effect of learning experiences on performance goal orientation – prove ($\beta = 0.236$, $t = 2.496$, $p = .013$). The effect of meaningful experiences and student interaction remained positive and statistically significant in the adjusted effect model (model 4), controlling for gender, age group, and study year group ($\beta = 0.236$, $t = 2.203$, $p = .028$). These results indicate that higher levels of meaningful experiences are associated with a higher level of performance goal orientation-prove.

Table 10
Effect of Learning Environment Dimensions on Performance Goal Orientation - prove

Predictor		(Model 3) PGO (prove)	(Model 4) PGO (prove)
LEF1		0.236**	0.236**
		(0.095)	(0.107)
LEF2		-0.019	0.002
		(0.108)	(0.128)
LEF3		-0.074	-0.062
		(0.114)	(0.127)
LEF4		-0.021	-0.014
		(0.089)	(0.114)
Gender	Male		
	Female		0.130
			(0.163)
Age group (years)	17 – 18		
	19 - 20		-0.283
			(0.202)
	21 – 22		-0.0945
			(0.496)
	23 – 24		0.009
			(0.576)
	>= 25		-0.127
			(0.710)
Year group	1st year		
	2nd year		0.195
			(0.209)
	3rd and 4th year		0.198
			(0.481)
	5th and 6th year		-0.009
			(0.572)
Constant		3.984***	3.751***
		(0.401)	(0.562)
Observations		377	337
R-squared		0.018	0.029

Note: PGO = Performance Goal Orientation, Models 3 provides unadjusted and models 4 provides adjusted effects. Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11 presents unadjusted and adjusted effects of learning environment components and test for their significance on performance goal orientation – avoid construct. Results of the unadjusted effects model (model 5) had a significant inverse effect of student-student interaction on performance goal orientation – avoid (β = -0.242, t = -3.176, p = .002). The effect of the student-student interaction remained inversely correlated and statistically significant in the adjusted effect model (model 6); controlling for gender, age group, and study year group (β = -0.242, t = -2.901, p = .004). These results indicate that higher levels of student-student interaction in the learning environment are associated with a lower level of performance goal orientation – avoid. Equivalently, increased levels of student-student interaction is associated with lower avoidance aspect of performance goal orientation.

Table 11
Effect of Learning Environment Dimensions on Performance Goal Orientation - Avoid

Predictor		(Model 5) PGO (Avoid)	(Model 6) PGO (Avoid)
LEF1		0.102	0.107
		(0.073)	(0.085)
LEF2		0.016	0.082
		(0.089)	(0.110)
LEF3		-0.242***	-0.242***
		(0.076)	(0.083)
LEF4		0.034	0.025
		(0.069)	(0.083)
Gender	Male		
	Female		0.288**
			(0.123)
Age group (years)	17 – 18		
	19 - 20		0.0492
			(0.146)
	21 – 22		-0.049
			(0.396)
	23 – 24		0.049
			(0.447)
	>= 25		-0.032
			(0.472)
Year group	1st year		
	2nd year		0.083
			(0.137)
	3rd and 4th year		0.238
			(0.401)
	5th and 6th year		0.038
			(0.460)
Constant		5.268***	4.735***
		(0.327)	(0.436)
Observations		377	337
R-squared		0.033	0.059

Note: PGO = Performance Goal Orientation, Model5 provide unadjusted and model 6 provide adjusted effects.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Chapter 4: Discussion and Perspectives

4.1. Discussion

Research Problem and Major Findings

This research aimed to investigate the learning environment and its influence on medical students in the UAE. The study took place at the CMHS at UAE University. This study is the first study to provide psychometric evidence for both Medical School Learning Environment Survey (MSLES) and goal orientation in the same context. The purpose of the research was to understand the changes necessary to improve the learning environment and provide actionable data to feed into curriculum development and enhance medical education. The MSLES assessed student perception of the learning environment and was integrated as a self-reporting survey to determine the learning environment influences medical student interaction, satisfaction, and performance. The Goal Orientation Questionnaire was used to determine student goal orientation levels. Our population included 13 medical students for the piloting process and 377 medical students from Y1 through Y6 who percent a QR code for the two online questionnaires and demographic questions. The piloting process provided an opportunity to uncover potential limitations and resolve them prior to the main study. There are no previous studies that investigated the relationship between goal orientation and learning environment for students enrolled in medical schools.

Significant findings indicate a difference in the perceived value of the learning environment between younger and older age groups, different levels of support for younger versus older groups, and a statistically significant impact of learning experiences end goal orientation from a positive and supportive learning environment.

Importance of Findings and Relationship to Similar Studies

The MSLES indicate that the mean score of learning experiences for students in Y3, Y4, Y5, and Y6 were significantly lower than Y1 and Y2 in terms of the significance of the difference in learning environments. This finding reveals that the learning environment is not as statistically relevant for younger students compared to older students. Given the age demographics of students in Y1 and Y2, there may be an age-related psychological reason those younger students feel their learning environment is not as important compared to older students who recognize the importance of a supportive learning environment. Another factor might be the increasing demand and complexity of the learning material as students transition from pre-medical years (Y1 and Y2) to pre-clinical and clinical years (Y3-Y6), which might influence their learning experience.

Results found a significant difference in the student-student interaction dimension of the learning environment, indicating that the students-to-student interaction for Y2 was significantly lower compared to other groups. This finding could indicate that the second year of medical school has significantly greater demands, but the environment discourages students from interacting with one another. This data did not investigate the reasons behind that difference, although understanding whether it is the result of heavy competition or schedule could help medical schools generally and the CMHS specifically in the future curriculum development and improvement or schedules accordingly. Possibly applying some interventions can enhance the quality of students to student interaction, by introducing other curricular or extracurricular activities for Y2 students that allow them to interact with one another. A possible example of that can be dedicating a protected time for homework's discussion in small groups.

Another statistically significant finding was regarding the student-faculty interaction dimension. Interactions were significantly higher for Y1 students compared to Y2 students at the CMHS. This difference in interactions with the faculty indicates that faculty are heavily involved with Y1 students, this could be due to different reasons; one of them is a program implemented in the college of medicine and health science for all Y1 students (mentorship program), as every Y1 student is assigned to faculty with frequent meeting and continuous guidance. And previous studies showed quality characteristic of medical school improve with mentoring programs.[38] Therefore, this could be a strong indication to this finding. Another reason could be that Y1 students do not hesitate to communicate with faculty, since they are new college students, and the influence of their high school experience of learning environment might be still there. And the learning environment do not provide the same level of involvement once students reach Y2. Understanding why this is could help facilities better implement ongoing interaction and support as students transition through the higher years of medical school. Conversely, understanding this might reveal that additional support is needed during the first year but no longer needed.

Regarding the academic support dimension of the learning environment, results indicate that academic support was significantly higher for Y1 students than the other groups. Understanding the reasons behind this by way of future research could determine whether increasing academic support for ongoing years should be considered an amendment to current curriculum standards to facilitate improved performance and reduce burnout.

Goal orientation has been looked at as three constructs: PGOP, PGOA, and LGO. Previous studies looked at the performance goal orientation as two factors and the other as three factors,[29,39,40] but the two seem to provide more actionable data and fewer limitations. The studies that used the three factors divided the avoid factor into two separate constructs.

Our study used three factors and found no significant difference in any of the three dimensions of the goal orientation construct.

Our results indicated a statistically significant weak positive correlation between the learning goal orientation and student-to-student interaction. The more student-to-student interactions within the learning environment, the better their learning goal orientation is for students. The effect of student-to-student interactions remained statistically significant and positive when adjusted and controlled for gender, study year group, and age group. These findings indicate increased student-to-student interaction at a higher level of learning goal orientation no matter the demographic. Universities and medical schools alike might do well to consider ways to increase student-to-student interactions to improve the learning experience. Our MSLES findings revealed that student-to-student interactions were statistically significantly lower in Y2 than in other years, highlighting a need for the CMHS to facilitate student-to-student interactions more regularly throughout the second year.

Findings showed that higher levels of learning experiences were associated with higher levels of performance goal orientation prove even when controlled for gender, age, and study year group. These findings might indicate that increased levels of learning experiences can enhance the performance goal orientation-prove of institutions generally and the CMHS specifically.

Performance goal orientation-avoid had a negative weak correlation to student and faculty interaction. This negative correlation indicates that increased interactions between students and faculty might has a detrimental influence on the performance goal orientation-avoid of students. The more faculty interact, the lower the performance goal orientation avoid is. Findings from the MSLES reported lower levels of student and faculty interaction beyond Y1, which indicates that universities and medical schools alike should integrate a process for

increased interaction between students and faculty as students' progress through medical school.

Button et al. (1996) reported that gender was unrelated to both goal orientations.[40] Conversely, Beaubien and Payne (1999) found that learning goal orientation was unrelated to gender, but females had a higher level of performance goal orientation than males.[41] Nevertheless, our studies did not corroborate a lack of gender influence on goal orientations.

In our study the statistically significant correlation between the learning environment components and goal orientations components were weak correlation. This weak correlation that existed even with the relatively big sample size; might indicates that tool we used to assess goal orientation was not specific to the medical students. As such future studies might consider establishing a specific tool that evaluate goal orientation in medical school learning environment specifically, which might reveal a highly specific and sensitive results between the learning environment and goal orientation.

4.2. Limitations

The most significant methodological limitation is the use of self-reported data. Conducting the quantitative research study by gathering information from people through surveys brings potential sources of bias, including selective memory by which students do or do not remember experiences or events correctly. Moreover, our response rate varied from one year to another, with Y2 enrolled students responding at only 55% compared to Y5 and Y6, which responded at 84%. Having varying levels of response rates could potentially influence the findings by not providing equal numbers of participants for each year.

One possible limitation included the lack of previous studies on the topic. Previous research studies have laid the foundation of the research problem in other countries,[8,21] other academic situations,[15] and other age groups.[42] The lack of available data for the UAE,

particularly for medical students in the UAE, served as an important opportunity for This research to identify new gaps in the literature.

This study was conducted in the first semester. As such, perceptions of the learning environment could be lacking compared to the same study presented during the second semester especially for Y1 student.

This research did not specify whether certain students each year were currently repeating that year. As such, no information is available to explain the difference between views of the learning environment for those who are currently repeating a year compared to those for whom that year of medical school is brand new. As previous studies has shown that students performance influenced their perception of the learning environment.[22] Measures used to collect the data were reliable; nonetheless, in retrospect integrating additional questions during the data-gathering portion of the survey to identify whether students were repeating that year of medical school could have helped address the emerging limitation.

The decision to enroll in medical school, particularly those students who have a relative in the field might be more likely to find the learning environment supportive, have expectations going in about a supportive or unsupportive learning environment, or be motivated beyond the learning environment to complete their medical education the same as a relative. This potential limitation was not evaluated in the findings, although a supported or unsupported learning environment can contribute to students' goal development and academic outcome.[43]

There are cultural considerations for this research. While the purpose was to evaluate the UAE university specifically, a place where previous research on the learning environment and medical school did not exist, a limitation of the researcher could include cultural bias. Given that data collection took the form of a survey, the way questions were ordered, or the use of certain words with negative or potentially positive inferences could represent a cultural

bias. There were limited situations with the MSLES piloting process where alternative wording had to be added as students were unclear about the word's meaning in the MSLES scale. In this research researchers worked to alleviate this potential bias by including alternative words in brackets and using a trusted survey source with unmodified language.

4.3. Conclusion

There is a lack of research focused on the medical school environment and its correlation with the medical student's goal orientation. This is the first study to offer psychometric evidence of the medical school learning environment and medical students goal orientation in the United Arab Emirates. This research has improved our understanding of what changes are necessary to enhance the learning environment across different years at the medical school in UAE University. The data and findings serve as actionable information for curriculum assessments and modifications to medical education in the UAE University. Through our surveys, the most important findings indicate that a better learning experiences and student-to-student interactions across all ages and demographics have the most significant influence on a positive learning environment. As such, the more medical schools can introduce student-to-student interactions and facilitate learning experiences, the higher might the performance and satisfaction levels can be achieved in the medical school learning environments.

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6. Appendix

6.1. Medical School Learning Environment Survey (MSLES) [3]

For the following questions, please choose the category of frequency that most closely approximates your perceptions of the learning climate in United Arab Emirates University at the College of Medicine and Health Sciences.

		never	seldom	occasionally	fairly often	very often
1.	The environment of the school allows for interests outside of medicine	①	②	③	④	⑤
2.	Upper-level students provide informal guidance to lower-level students.	①	②	③	④	⑤
3.	Students gather together for informal activities	①	②	③	④	⑤
4.	Students in the school get to know each other well	①	②	③	④	⑤
5.	Students spend time assisting each other	①	②	③	④	⑤
6.	Students hesitate to express their opinions and ideas to faculty	①	②	③	④	⑤
7.	Student complaints are responded to with meaningful action	①	②	③	④	⑤
8.	Students have difficulty finding time for family and friends	①	②	③	④	⑤
9.	Competition for grades is intense	①	②	③	④	⑤
10.	The relationship between basic science and clinical material is unclear.	①	②	③	④	⑤
11.	Exams emphasize understanding of concepts	①	②	③	④	⑤
12.	Courses emphasize the interdependence of facts, concepts and principles	①	②	③	④	⑤
13.	Exams provide a fair measure of student achievement	①	②	③	④	⑤
14.	Students in the school are distant with each other	①	②	③	④	⑤
15.	Faculty are reserved and distant with students	①	②	③	④	⑤
16.	Faculty, administrators, and staff give personal help to students having academic difficulty	①	②	③	④	⑤
17.	Students are reluctant to share with each other problems they are having	①	②	③	④	⑤

6.2. Goal orientation Questionnaire [29]

For each item, decide how strongly you agree with each statement. Use 1-7 to indicate your level of agreement:

1	2	3	4	5	6	7
Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree or disagree)	Agree	Agree Very Much	Strongly Agree

Learning Goal Orientation

1 I enjoy challenging and difficult tasks where I learn new skills. _____
2 I want to learn as much as possible. _____
3 The opportunity to learn new skills and knowledge is important to me. _____
4 I prefer to work on tasks that force me to learn new things. _____
5 The opportunity to extend the range of my abilities is important to me. _____
6 I like best when something I learn makes me want to find out more. _____
7 When I fail to complete a difficult task, I plan to try harder the next time I work on it. ___
8 The opportunity to learn new things is important to me. _____
Sum total (range 8-56, midpoint 32) = _____

Performance Goal Orientation - Prove
1 I prefer to work on projects in which I can prove my ability to others. _____
2 I want others to think I am smart. _____
3 I enjoy proving my ability to others. _____
4 I am motivated by the thought of outperforming my peers. _____
5 The opinions of others about how well I do certain things are important to me. _____
6 I strive to demonstrate my ability relative to others. _____
Sum total (range 6-42, midpoint 24) = _____

Performance Goal Orientation - Avoid
1 The things that I enjoy most are the things I do best. _____
2 I prefer to do things that I can do well rather than things that I do poorly. _____
3 I like to work on tasks that I have done well in the past. _____
4 Because I know my work will be compared to others, I get nervous. _____
5 My fear of performing poorly is often what motivates me. _____
6 I prefer to avoid situations in which I might perform poorly. _____
7 I like to be fairly confident that I can successfully perform a task before I attempt it. _____

Sum total (range 7-49, midpoint 28) = _____

6.3. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 1 medical students

HARVARD
MEDICAL SCHOOL

Medical School Learning Environment

For the following questions, please choose the category of frequency that most closely approximates your perceptions of the learning environment in UAE University at the College of Medicine and Health Sciences.

	Never	Rare	Occasionally	Fairly often	Very often	Not applicable
1. The environment of the school allows for interests outside of medicine	○	○	○	○	○	○
2. Upper-level students provide informal (simple) guidance to lower-level students.	○	○	○	○	○	○
3. Students gather together for informal activities (other than medicine)	○	○	○	○	○	○
4. Students in the school get to know each other well.	○	○	○	○	○	○
5. Students spend time assisting each other.	○	○	○	○	○	○
6. Students hesitate to express their opinions and ideas to faculty.	○	○	○	○	○	○
	Never	Rare	Occasionally	Fairly often	Very often	Not applicable
7. Student complaints are responded to with meaningful action.	○	○	○	○	○	○
8. Students have difficulty finding time for family and friends.	○	○	○	○	○	○
9. Competition for grades is intense.	○	○	○	○	○	○
10. The relationship between basic science and clinical material is unclear.	○	○	○	○	○	○
11. Exams emphasize understanding of concepts.	○	○	○	○	○	○
12. Courses emphasize the interdependence (relationship) of facts, concepts and principles.	○	○	○	○	○	○
	Never	Rare	Occasionally	Fairly often	Very often	Not applicable
13. Exams provide a fair measure of student achievement.	○	○	○	○	○	○
14. Students in the school are distant with each other.	○	○	○	○	○	○
15. Faculty are reserved and distant with students.	○	○	○	○	○	○
16. Faculty, administrators, and staff give personal help to students having academic difficulty.	○	○	○	○	○	○
17. Students are reluctant (hesitant) to share with each other problems they are having.	○	○	○	○	○	○

6.3. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 1 medical students (continued)

Learning Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (neither agree or disagree)	Agree	Agree Very Much	Strongly Agree
1. I enjoy challenging and difficult tasks where I learn new skills.	○	○	○	○	○	○	○
2. I want to learn as much as possible.	○	○	○	○	○	○	○
3. The opportunity to learn new skills and knowledge is important to me.	○	○	○	○	○	○	○
4. I prefer to work on tasks that force me to learn new things.	○	○	○	○	○	○	○
5. The opportunity to extend the range of my abilities is important to me.	○	○	○	○	○	○	○
6. I like best when something I learn makes me want to find out more.	○	○	○	○	○	○	○
7. When I fail to complete a difficult task, I plan to try harder the next time I work on it.	○	○	○	○	○	○	○
8. The opportunity to learn new things is important to me.	○	○	○	○	○	○	○

Performance Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Agree	Agree Very Much	Strongly Agree
1. I prefer to work on projects in which I can prove my ability to others.	○	○	○	○	○	○	○
2. I want others to think I am smart.	○	○	○	○	○	○	○
3. I enjoy proving my ability to others.	○	○	○	○	○	○	○
4. I am motivated by the thought of outperforming (performing better than) my peers.	○	○	○	○	○	○	○
5. The opinions of others about how well I do certain things are important to me.	○	○	○	○	○	○	○
6. I strive (make great effort) to demonstrate my ability relative to others.	○	○	○	○	○	○	○

Performance Goal Orientation - continued

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Somewhat agree	Agree Very Much	Strongly Agree
1. The things that I enjoy most are the things I do best.	○	○	○	○	○	○	○
2. I prefer to do things that I can do well rather than things that I do poorly	○	○	○	○	○	○	○
3. I like to work on tasks that I have done well in the past.	○	○	○	○	○	○	○
4. Because I know my work will be compared to others, I get nervous.	○	○	○	○	○	○	○
5. My fear of performing poorly is often what motivates me.	○	○	○	○	○	○	○
6. I prefer to avoid situations in which I might perform poorly.	○	○	○	○	○	○	○
7. I like to be fairly confident that I can successfully perform a task before I attempt it.	○	○	○	○	○	○	○

6.3. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 1 medical students (continued)

Gender

- Male
- Female

Your Age

- 16 years or less, please specify
- 17-18 years
- 19-20 years
- 21-22 years
- 23 years or more, please specify

Average % score in the last academic year (e.g. 94)

Did you repeat year 1 at the medical school?

- Yes
- No

I repeated the year because

- I failed a class (due to my academic performance)
- Personal related issue
- Family related issue
- Other, please specify below

Were you inspired to enrol in the medical school, because of a family member or a close person who works in the medical field?

- Yes
- No

6.4. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 2 medical students (continued)

HARVARD
MEDICAL SCHOOL

Medical School Learning Environment

For the following questions, please choose the category of frequency that most closely approximates your perceptions of the learning environment in UAE University at the College of Medicine and Health Sciences.

	Never	Rare	Occasionally	Fairly often	Very often
1. The environment of the school allows for interests outside of medicine	○	○	○	○	○
2. Upper-level students provide informal (simple) guidance to lower-level students.	○	○	○	○	○
3. Students gather together for informal activities (other than medicine)	○	○	○	○	○
4. Students in the school get to know each other well	○	○	○	○	○
5. Students spend time assisting each other	○	○	○	○	○
6. Students hesitate to express their opinions and ideas to faculty	○	○	○	○	○
7. Student complaints are responded to with meaningful action	○	○	○	○	○
8. Students have difficulty finding time for family and friends	○	○	○	○	○
9. Competition for grades is intense	○	○	○	○	○
10. The relationship between basic science and clinical material is unclear	○	○	○	○	○
11. Exams emphasize understanding of concepts	○	○	○	○	○
12. Courses emphasize the interdependence (relationship) of facts, concepts and principles	○	○	○	○	○
13. Exams provide a fair measure of student achievement	○	○	○	○	○
14. Students in the school are distant with each other	○	○	○	○	○
15. Faculty are reserved and distant with students	○	○	○	○	○
16. Faculty, administrators, and staff give personal help to students having academic difficulty	○	○	○	○	○
17. Students are reluctant (hesitant) to share with each other problems they are having	○	○	○	○	○

6.4. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 2 medical students (continued)

Learning Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (neither agree or disagree)	Agree	Agree Very Much	Strongly Agree
1. I enjoy challenging and difficult tasks where I learn new skills.	○	○	○	○	○	○	○
2. I want to learn as much as possible.	○	○	○	○	○	○	○
3. The opportunity to learn new skills and knowledge is important to me.	○	○	○	○	○	○	○
4. I prefer to work on tasks that force me to learn new things.	○	○	○	○	○	○	○
5. The opportunity to extend the range of my abilities is important to me.	○	○	○	○	○	○	○
6. I like best when something I learn makes me want to find out more.	○	○	○	○	○	○	○
7. When I fail to complete a difficult task, I plan to try harder the next time I work on it.	○	○	○	○	○	○	○
8. The opportunity to learn new things is important to me.	○	○	○	○	○	○	○

Performance Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Agree	Agree Very Much	Strongly Agree
1. I prefer to work on projects in which I can prove my ability to others.	○	○	○	○	○	○	○
2. I want others to think I am smart.	○	○	○	○	○	○	○
3. I enjoy proving my ability to others.	○	○	○	○	○	○	○
4. I am motivated by the thought of outperforming (performing better than) my peers.	○	○	○	○	○	○	○
5. The opinions of others about how well I do certain things are important to me.	○	○	○	○	○	○	○
6. I strive (make great effort) to demonstrate my ability relative to others.	○	○	○	○	○	○	○

Performance Goal Orientation - continued

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Somewhat agree	Agree Very Much	Strongly Agree
1. The things that I enjoy most are the things I do best.	○	○	○	○	○	○	○
2. I prefer to do things that I can do well rather than things that I do poorly	○	○	○	○	○	○	○
3. I like to work on tasks that I have done well in the past.	○	○	○	○	○	○	○
4. Because I know my work will be compared to others, I get nervous.	○	○	○	○	○	○	○
5. My fear of performing poorly is often what motivates me.	○	○	○	○	○	○	○
6. I prefer to avoid situations in which I might perform poorly.	○	○	○	○	○	○	○
7. I like to be fairly confident that I can successfully perform a task before I attempt it.	○	○	○	○	○	○	○

6.4. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 2 medical students (continued)

Gender

- Male
- Female

Age group

- 18 years or less, please specify below
- 19- 20 years
- 21-22 years
- 23-24 years
- 25 years or more, please specify below

GPA (grade point average) in the last academic year

Did you repeat any year at the medical school?

- Yes
- No

I repeated the year because

- I failed a class (due to my academic performance)
- Personal related issue
- Family related issue
- Other, please specify below

Which year did you repeat?

- Year 1
- Year 2

Were you inspired to enrol in the medical school, because of a family member or a close person who works in the medical field?

- Yes
- No

6.5. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 3 and 4 medical students

HARVARD
MEDICAL SCHOOL

Medical School Learning Environment

For the following questions, please choose the category of frequency that most closely approximates your perceptions of the learning Environment in UAE University at the College of Medicine and Health Sciences.

	Never	Rare	Occasionally	Fairly often	Very often
1. The environment of the school allows for interests outside of medicine	○	○	○	○	○
2. Upper-level students provide informal (simple) guidance to lower-level students.	○	○	○	○	○
3. Students gather together for informal activities (other than medicine)	○	○	○	○	○
4. Students in the school get to know each other well	○	○	○	○	○
5. Students spend time assisting each other	○	○	○	○	○
6. Students hesitate to express their opinions and ideas to faculty	○	○	○	○	○
7. Student complaints are responded to with meaningful action	○	○	○	○	○
8. Students have difficulty finding time for family and friends	○	○	○	○	○
9. Competition for grades is intense	○	○	○	○	○
10. The relationship between basic science and clinical material is unclear	○	○	○	○	○
11. Exams emphasize understanding of concepts	○	○	○	○	○
12. Courses emphasize the interdependence (relationship) of facts, concepts and principles	○	○	○	○	○
13. Exams provide a fair measure of student achievement	○	○	○	○	○
14. Students in the school are distant with each other	○	○	○	○	○
15. Faculty are reserved and distant with students	○	○	○	○	○
16. Faculty, administrators, and staff give personal help to students having academic difficulty	○	○	○	○	○
17. Students are reluctant (hesitant) to share with each other problems they are having	○	○	○	○	○

6.5. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 3 and 4 medical students (continued)

Learning Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (neither agree or disagree)	Agree	Agree Very Much	Strongly Agree
1. I enjoy challenging and difficult tasks where I learn new skills.	○	○	○	○	○	○	○
2. I want to learn as much as possible.	○	○	○	○	○	○	○
3. The opportunity to learn new skills and knowledge is important to me.	○	○	○	○	○	○	○
4. I prefer to work on tasks that force me to learn new things.	○	○	○	○	○	○	○
5. The opportunity to extend the range of my abilities is important to me.	○	○	○	○	○	○	○
6. I like best when something I learn makes me want to find out more.	○	○	○	○	○	○	○
7. When I fail to complete a difficult task, I plan to try harder the next time I work on it.	○	○	○	○	○	○	○
8. The opportunity to learn new things is important to me.	○	○	○	○	○	○	○

Performance Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Agree	Agree Very Much	Strongly Agree
1. I prefer to work on projects in which I can prove my ability to others.	○	○	○	○	○	○	○
2. I want others to think I am smart.	○	○	○	○	○	○	○
3. I enjoy proving my ability to others.	○	○	○	○	○	○	○
4. I am motivated by the thought of outperforming (performing better than) my peers.	○	○	○	○	○	○	○
5. The opinions of others about how well I do certain things are important to me.	○	○	○	○	○	○	○
6. I strive (make great effort) to demonstrate my ability relative to others.	○	○	○	○	○	○	○

Performance Goal Orientation - continued

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Somewhat agree	Agree Very Much	Strongly Agree
1. The things that I enjoy most are the things I do best.	○	○	○	○	○	○	○
2. I prefer to do things that I can do well rather than things that I do poorly	○	○	○	○	○	○	○
3. I like to work on tasks that I have done well in the past.	○	○	○	○	○	○	○
4. Because I know my work will be compared to others, I get nervous.	○	○	○	○	○	○	○
5. My fear of performing poorly is often what motivates me.	○	○	○	○	○	○	○
6. I prefer to avoid situations in which I might perform poorly.	○	○	○	○	○	○	○
7. I like to be fairly confident that I can successfully perform a task before I attempt it.	○	○	○	○	○	○	○

6.5. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 3 and 4 medical students (continued)

Gender

- Male
- Female

Age group

- 19 years or less, please specify
- 20-21 years
- 22-23 years
- 24-25 years
- 26 years or more, please specify

Year in medical school

- Year 3
- Year 4

GPA (grade point average) in the last academic year

Did you repeat any year at the medical school?

- Yes
- No

Which year did you repeat?

- Year 1
- Year 2
- Year 3
- Year 4

I repeated the year because

- I failed a class (due to my academic performance)
- Personal related issue
- Family related issue
- Other, please specify below

Were you inspired to enrol in the medical school, because of a family member or a close person who works in the medical field?

- Yes
- No

6.6. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 5 and 6 medical students

HARVARD
MEDICAL SCHOOL

Medical School Learning Environment

For the following questions, please choose the category of frequency that most closely approximates your perceptions of the learning Environment in UAE University at the College of Medicine and Health Sciences.

	Never	Rare	Occasionally	Fairly often	Very often
1. The environment of the school allows for interests outside of medicine	○	○	○	○	○
2. Upper-level students provide informal (simple) guidance to lower-level students.	○	○	○	○	○
3. Students gather together for informal activities (other than medicine)	○	○	○	○	○
4. Students in the school get to know each other well	○	○	○	○	○
5. Students spend time assisting each other	○	○	○	○	○
6. Students hesitate to express their opinions and ideas to faculty	○	○	○	○	○
7. Student complaints are responded to with meaningful action	○	○	○	○	○
8. Students have difficulty finding time for family and friends	○	○	○	○	○
9. Competition for grades is intense	○	○	○	○	○
10. The relationship between basic science and clinical material is unclear	○	○	○	○	○
11. Exams emphasize understanding of concepts	○	○	○	○	○
12. Courses emphasize the interdependence (relationship) of facts, concepts and principles	○	○	○	○	○
13. Exams provide a fair measure of student achievement	○	○	○	○	○
14. Students in the school are distant with each other	○	○	○	○	○
15. Faculty are reserved and distant with students	○	○	○	○	○
16. Faculty, administrators, and staff give personal help to students having academic difficulty	○	○	○	○	○
17. Students are reluctant (hesitant) to share with each other problems they are having	○	○	○	○	○

6.6. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 5 and 6 medical students (continued).

Learning Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (neither agree or disagree)	Agree	Agree Very Much	Strongly Agree
1. I enjoy challenging and difficult tasks where I learn new skills.	○	○	○	○	○	○	○
2. I want to learn as much as possible.	○	○	○	○	○	○	○
3. The opportunity to learn new skills and knowledge is important to me.	○	○	○	○	○	○	○
4. I prefer to work on tasks that force me to learn new things.	○	○	○	○	○	○	○
5. The opportunity to extend the range of my abilities is important to me.	○	○	○	○	○	○	○
6. I like best when something I learn makes me want to find out more.	○	○	○	○	○	○	○
7. When I fail to complete a difficult task, I plan to try harder the next time I work on it.	○	○	○	○	○	○	○
8. The opportunity to learn new things is important to me.	○	○	○	○	○	○	○

Performance Goal Orientation

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Agree	Agree Very Much	Strongly Agree
1. I prefer to work on projects in which I can prove my ability to others.	○	○	○	○	○	○	○
2. I want others to think I am smart.	○	○	○	○	○	○	○
3. I enjoy proving my ability to others.	○	○	○	○	○	○	○
4. I am motivated by the thought of outperforming (performing better than) my peers.	○	○	○	○	○	○	○
5. The opinions of others about how well I do certain things are important to me.	○	○	○	○	○	○	○
6. I strive (make great effort) to demonstrate my ability relative to others.	○	○	○	○	○	○	○

Performance Goal Orientation - continued

	Strongly Disagree	Very Much Disagree	Disagree	Neutral (Neither agree nor disagree)	Somewhat agree	Agree Very Much	Strongly Agree
1. The things that I enjoy most are the things I do best.	○	○	○	○	○	○	○
2. I prefer to do things that I can do well rather than things that I do poorly	○	○	○	○	○	○	○
3. I like to work on tasks that I have done well in the past.	○	○	○	○	○	○	○
4. Because I know my work will be compared to others, I get nervous.	○	○	○	○	○	○	○
5. My fear of performing poorly is often what motivates me.	○	○	○	○	○	○	○
6. I prefer to avoid situations in which I might perform poorly.	○	○	○	○	○	○	○
7. I like to be fairly confident that I can successfully perform a task before I attempt it.	○	○	○	○	○	○	○

6.6. Screen shot of Qualtrics pages used to collect Medical School Learning Environment Survey (MSLES), Goal orientation questionnaire along with demographic information from year 5 and 6 medical students (continued).

Gender

- Male
- Female

Age group

- 21 years or less, please specify
- 22-23 years
- 24-25 years
- 26-27 years
- 28 years or more, please specify

Year in medical school

- Year 5
- Year 6

GPA (grade point average) in the last academic year

Did you repeat any year at the medical school?

- Yes
- No

Which year did you repeat?

- Year 1
- Year 2
- Year 3
- Year 4
- Year 5
- Year 6

I repeated the year because

- I failed a class (due to my academic performance)
- Personal related issue
- Family related issue
- Other, please specify below

Were you inspired to enrol in the medical school, because of a family member or a close person who works in the medical field?

- Yes
- No

6.7 Consent form

Social Sciences Research Ethics Committee
- Consent to Participate in a Research Study-

Please read carefully before signing the Consent Form!

The Medical School Learning Environment's Influence on Goal Orientation

You will be asked to provide or deny consent after reading this form.

Topic of the research, the researcher(s) and the location

You have been invited to take part in a study to investigate The Medical School Learning Environment's Influence on Medical students Goal Orientation at the College of Medicine and Health Sciences at UAE University. This study will be conducted by Dr Afaf Alblooshi in the department of medical education, UAE University. The study will take place at UAE University, College of Medicine and Health Sciences located at Khalifa Bin Zayed Street, Tawam, Al Ain, Next to Tawam Hospital - Abu Dhabi, UAE. Participation in this study will take 45 minutes for the focus group discussion.

Benefit of the research

Although you will receive no direct benefits from this study, this research will help us better understand the learning environment at the college of Medicine and health sciences and its influence on medical students' goal orientation.

Procedure/setting

You will be invited to fill in a survey about the learning environment and your goal orientation and you will be invited to a virtual focus group discussion meeting on Zoom. You will be with 7 students in the same year and the focus group interviewer who will lead the discussion.

Confidentiality and Privacy Information

Your private information will not be revealed or must be revealed. If it must be revealed, then they should be fully aware of that.

Right to Withdraw

You can withdraw at any stage in the process without them being penalized.

Informed Consent

1. I confirm that I have read and understood the above information sheet and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw.
3. I understand that my data will be kept confidential and if published, the data will not be identifiable as mine.

I agree to take part in this study:

_____ _____
(Name and signature of participant) (Date)

_____ _____
(Name and signature of person taking consent) (Date)

6.8. descriptive summary of the student's responses to the different items of the medical school learning environment survey (MSLES) (n=377)

Appendix 6.8. A descriptive summary of the student's responses to the different items of the medical school learning environment survey (MSLES) (n=377)

Items of the MSLES	Missing responses	Available responses	Percentage of missing responses
1. The environment of the school allows for interests outside of medicine	2	375	0.5
2. Upper-level students provide informal guidance to lower-level students.	2	375	0.5
3. Students gather together for informal activities	2	375	0.5
4. Students in the school get to know each other well	1	376	0.3
5. Students spend time assisting each other	1	376	0.3
6. Students hesitate to express their opinions and ideas to faculty	2	375	0.5
7. Student complaints are responded to with meaningful action	5	372	1.3
8. Students have difficulty finding time for family and friends	3	374	0.8
9. Competition for grades is intense	3	374	0.8
10. The relationship between basic science and clinical material is unclear.	4	373	1.1
11. Exams emphasize understanding of concepts	1	376	0.3
12. Courses emphasize the interdependence of facts, concepts and principles	3	374	0.8
13. Exams provide a fair measure of student achievement	1	376	0.3
14. Students in the school are distant with each other	3	374	0.8
15. Faculty are reserved and distant with students	2	375	0.5
16. Faculty, administrators, and staff give personal help to students having academic difficulty	7	370	1.9
17. Students are reluctant to share with each other problems they are having	5	372	1.3

Appendix 6.9. A descriptive summary of the student's responses to the different items of the goal orientation survey (n=377)

Appendix 6.9. A descriptive summary of the student's responses to the different items of the goal orientation survey (n=377)

Items of the goal orientation survey	Missing responses	Available responses	Percentage of missing responses
Learning Goal Orientation			
1. I enjoy challenging and difficult tasks where I learn new skills.	26	351	7.4
2. I want to learn as much as possible.	25	352	7.1
3. The opportunity to learn new skills and knowledge is important to me.	25	352	7.1
4. I prefer to work on tasks that force me to learn new things.	25	352	7.1
5. The opportunity to extend the range of my abilities is important to me.	25	352	7.1
6. I like best when something I learn makes me want to find out more.	26	351	7.4
7. When I fail to complete a difficult task, I plan to try harder the next time I work on it.	25	352	7.1
8. I enjoy challenging and difficult tasks where I learn new skills.	25	352	7.1
Performance Goal Orientation (Prove)			
1. I prefer to work on projects in which I can prove my ability to others.	31	346	9.0
2. I want others to think I am smart.	31	346	9.0
3. I enjoy proving my ability to others.	31	346	9.0
4. I am motivated by the thought of outperforming my peers.	31	346	9.0
5. The opinions of others about how well I do certain things are important to me.	31	346	9.0
6. I strive to demonstrate my ability relative to others.	32	345	9.3
Performance Goal Orientation (Avoid)			
1. The things that I enjoy most are the things I do best.	41	336	12.2
2. I prefer to do things that I can do well rather than things that I do poorly.	42	335	12.5
3. I like to work on tasks that I have done well in the past.	41	336	12.2
4. Because I know my work will be compared to others, I get nervous.	41	336	12.2
5. My fear of performing poorly is often what motivates me.	44	333	13.2
6. I prefer to avoid situations in which I might perform poorly.	41	336	12.2
7. I like to be fairly confident that I can successfully perform a task before I attempt it.	41	336	12.2

Appendix 6.10. A descriptive summary of the student's response to the different items in the demographic and academic performance part of the survey (n=377)

Appendix 6.10. A descriptive summary of the student's responses to the different items in the demographic and academic performance part of the survey (n=377)

Items of the demographic information	Missing responses	Available responses	Percentage of missing responses
Gender	40	337	11.9
GPA in the last academic year	77	300	25.7
Repeat year at medical school	41	336	12.2
Inspiration to enrol in medical school because of a family member or a close person who works in the medical field	38	339	11.2

Appendix 6.11. Descriptive summary of reason of repeated year at different years at the medical school

Appendix 6.11. Reason for repeated year in different years at the medical school

Reason for repeated year	Year in medical school				
	Y1-Y6 (n=24)	**Y1** (n=0)	**Y2** (n=2)	**Y3 & Y4** (n=9)	**Y5 & Y6** (n=13)
Failed class due to academic performance	**10 (41.7%)**	-	1 (50%)	5 (55.6%)	4 (30.8%)
Failed class due to academic performance & Personal related issues	**5 (20.8%)**	-	1 (50%)	1 (11.1%)	3 (23.1%)
Failed class due to academic performance & Personal related issues & Family related issues	**3 (12.5%)**	-	-	2 (22.2%)	1 (7.7%)
Failed class due to academic performance & Family related issues	**1 (4.2%)**	-	-	-	1 (7.7%)
Personal related issues	**1 (4.2%)**	-	-	-	1 (7.7%)
Personal related issues & Family related issues	**1 (4.2%)**	-	-	-	1 (7.7%)
Personal related issues & Family related issues & Other*	**1 (4.2%)**	-	-	-	1 (7.7%)
Personal related issues & Other*	**1 (4.2%)**	-	-	-	1 (7.7%)
Other*	**1 (4.2%)**	-	-	1 (11.1%)	-

*Other reasons were: (1) Giving birth, (2) COVID-19 and health issues (3) Health issues
* Percentage presented are from the year in medical school