

Leadership and Professionalism Curriculum in the Gross Anatomy Course

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Abstract

Introduction: Today's physicians must demonstrate both professionalism and leadership skills in order to succeed in largely team-based healthcare environments. The purpose of this study was to determine if professionalism attributes, leadership style, and leadership style adaptability are associated with academic performance among first-year students early in their medical curriculum. **Materials and Methods:** Students were divided into 4-member dissection groups for the duration of the Gross and Developmental Anatomy course. Leadership responsibility was randomly assigned to a team member on a rotating basis every 5 weeks. After each 5-week block, student performance was measured by written and practical examinations, and each student assessed their leader's or their own professionalism attributes and leadership style using validated survey instruments. **Results:** Most students demonstrated either a "selling" only (57%) or "participating" only (30%) leadership style with low to moderate leadership adaptability. "Participating" and "delegating" leadership styles have the highest average group written exam scores (89.4%, $P < 0.008$). "Telling" only or "selling" only leaders have the lowest average group exam scores (83.5%, $P < 0.001$). "Selling" and "participating" leaders have significantly lower average group practical exam scores than other styles (81.5%, $P < 0.007$). Positive associations were observed between the written and practical examination scores and the leader's integrity ($P = 0.003$, $P = 0.002$) and responsibility ($P < 0.001$, $P = 0.037$). **Conclusions:** This study demonstrates that various situational leadership styles and aspects of professionalism are associated with written and practical examination scores in the Gross and Developmental Anatomy course. Furthermore, it demonstrates that first-year medical students are in need of leadership skill development.

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Introduction

Healthcare delivery systems worldwide are currently undergoing significant changes to create resilient learning organisations that are able to adapt with ever-increasing speed to shifting business, regulatory, and competitive environments.^{1,2} The delivery of healthcare is no longer a single-provider responsibility; modern group practice organisations require a physician to be not only a member of a team, but also a leader, often of several teams that must work together.³ This team approach in healthcare fosters ongoing reflection on medical practices and their outcomes, which is instrumental in improving the quality of patient

care.¹ In caring for patients, healthcare providers need to rely on each other's skills to minimise risk and decrease the number of medical errors.⁴ Thus, in order to be successful in today's healthcare system, graduating physicians must possess new knowledge and competencies such as professionalism, leadership, and teamwork skills.

Team structure, team function, and effective leadership skills should be part of all physicians' medical training.³ In the United States, the Accreditation Council for Graduate Medical Education (ACGME) has recognised the importance of professionalism, teamwork, and leadership in its 6 competencies for resident education; for instance,

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one competency is devoted entirely to “professionalism”.⁵ Furthermore, under the competency “interpersonal and communications skills,” residents must be proficient in “teaming with patients, their patients’ families, and professional associates”.⁵ As professionalism and leadership skills are being recognised as critical to resident education, so too should they be acknowledged and made part of medical school education. Unfortunately, past medical school curricula have failed to adequately address issues such as knowledge of team structure, principles of effective leadership, and professionalism. The mission to address the team approach to healthcare has emerged as an important goal in reshaping medical school curricula.

Many groups outside of the field of medical education have recognised the importance of leadership skills in society. For instance, Hersey and Blanchard⁶ have introduced a theory of situational leadership which indicates that the most effective leaders are those capable of using different leadership styles in response to the demands of the situation. It seems, then, that flexibility in leadership style is a necessity if a high level of leadership effectiveness is desired and required by the situation.⁷

Hersey and Blanchard previously identified 4 leadership styles.⁶ The first style, “telling,” involves the leader telling the followers precisely what to do and how to do it. The leader essentially guides or directs the group. The second style, “selling,” is characterised by the leader still guiding the group, but also encouraging dialogue and providing explanations. “Participating,” the third leadership style, involves much communication with team members by the leader but much less guidance. The “participating” leader collaborates, encourages, and facilitates. The last leadership style, “delegating,” entails much less direction and much more observing. The “delegating” leader generally allows individual group members to take on responsibility while the leader monitors the whole group. The authors report that certain leadership styles are better suited than others to enhance productivity within the work force.⁶

These leadership styles have been studied in various populations. For example, one study examined both student and parent perceptions of parent leadership styles and efficacy.⁸ Another study in the field of nurse education suggested that the Hersey and Blanchard model should be used to identify leadership traits in nursing preceptors in order to optimise the matching of preceptors with students based on student needs.⁹

Professionalism is another important area that is being addressed during medical education. The American Board of Internal Medicine’s Charter on Medical Professionalism declares that “professionalism is the basis of medicine’s contract with society”.¹⁰ Yet a study performed several years ago demonstrated that 40% of the surveyed medical

students, house officers, and practising physicians were unsatisfied with their professionalism education.¹¹ Thus, it is apparent that professionalism and leadership skills are essential for healthcare providers in today’s society and there is much room for improvement in both professionalism and leadership education in medical schools. The goal of this study was to determine if teamwork, professionalism attributes, leadership style, and leadership style adaptability are associated with academic performance of first-year medical students in early medical curriculum. The timing of the gross anatomy course, which is usually early in the medical curriculum in the United States, the amount and intensity of learning assignments, and the nature of learners’ interactions all made the Gross and Developmental Anatomy Course ideal for use in this study. The academic performance of a dissection team was evaluated as an outcome indicator of leadership effectiveness in a task in which team-learning was perceived as a directed goal.

Materials and Methods

Students participating in the first-year Gross and Developmental Anatomy Course at the Mayo Clinic College of Medicine during the 2004 school year were divided into 11 dissection groups (10 with 4 members and 1 with 3 members) with whom they worked intimately for the duration of the 5-month class. Students were assigned to groups, and there were no significant differences in average past academic performance indicators among dissection groups. Leadership responsibility was randomly assigned to a team member on a rotating basis every 5 weeks, resulting in 4 exam periods. The leader was responsible for overseeing the day-to-day team-based learning activities, coordinating reciprocal peer-teaching exercises, organising review sessions, ensuring the team’s compliance with peer evaluations and self-evaluations, and the completion of laboratory objectives by all members of the group.^{12,13}

At the end of each 5-week exam period, student performance in the course was measured by a written and a practical examination. In addition, each student was asked to assess their leader’s professionalism characteristics and leadership style; likewise, leaders assessed themselves. This assessment was completed via 2 survey instruments: a modified version of the Professional Associate Ratings (PARs) survey instrument from “Project Professionalism”¹⁴ and the Leadership Effectiveness and Adaptability Description (LEAD) survey instrument developed by Hersey and Blanchard.¹⁵ The modified PARs survey instrument consists of 9-point Likert scales that assess a leader’s respect, integrity, responsibility, compassion, problem-solving, commitment to excellence, and overall professionalism (Appendix 1). The LEAD survey instrument presents a variety of cases and requires that one determine the most likely action of the leader being evaluated. Vari-

ous algorithms are then used to convert these answers into numerical values that reveal the perception of the leader’s leadership style.^{6,15} One leader can have more than one primary leadership style. These same cases are also used to numerically assess the ability of the leader to appropriately vary leadership styles, as different situations will be best handled using different styles. A style adaptability score (SAS) was determined for each leader by each team member and themselves. The SAS can be categorised into low (0-23), moderate (24-29), and high (30-36) adaptability.¹⁵ Although participation in this study was mandatory for all students, results of the survey instruments had no impact on the student’s final grade in the course.

Approval for this study was granted by the Mayo Foundation Institutional Review Board (protocol # 1502-04).

Statistics

Univariate clustered linear regression was used to predict the average team exam scores (written, practical, and overall scores averaged across teammates) within each exam period from the average professionalism ratings (respect, integrity, responsibility, compassion, problem solving, commitment to excellence and overall professionalism, not including self-reported scores by the leaders), self-reported SAS, self-reported primary leadership style, and gender of the leader. Students at the same table form a cluster, while the exam period is a repeated effect. An unstructured correlation structure (unique correlations between each pair of exam periods) was used in the modelling.

The self-reported primary leadership style was measured as separate yes/no values for telling, selling, participating, and delegating components. A person can have more than one primary style according to the scoring algorithm of the LEAD survey instrument. Due to this and to small counts, we categorised the styles into 4 groups: 1) “telling” only or “selling” only; 2) “participating” only; 3) combined “selling” and “participating;” and 4) combined “participating” and “delegating” styles.

Gender comparisons of professionalism and leadership measurements were done using the *t*-test and Fisher’s exact test, as appropriate. SAS Version 8 software (SAS Institute Inc., Cary, NC, USA, 1999) was used for all calculations.

Results

Surveys were completed by all 43 first-year medical students after each 5-week period of the Gross and Developmental Anatomy course. A total of 172 LEAD surveys and 128 PARs survey instruments were completed (100% participation) and evaluated in this study. Participants were 53% male (23/43) and 47% female (20/43).

Table 1. Results of Survey Instruments With Respect to Professionalism and Leadership

Variable	Mean ± SD or n (%)
Modified Professional Associate Ratings (PARs) survey instrument*	
Respect	7.9 ± 0.9
Integrity	8.1 ± 0.8
Responsibility	8.1 ± 0.9
Compassion	7.6 ± 1.2
Problem-solving	7.3 ± 1.1
Commitment to excellence	8.0 ± 0.8
Overall professionalism	8.0 ± 0.9
Leadership Effectiveness and Adaptability Description (LEAD) survey instrument†	
Style Adaptability Score (SAS)	22.6 ± 4.3
Categorised SAS	
0-23 (low)	23 (52%)
24-29 (moderate)	19 (43%)
30-36 (high)	2 (5%)
Primary leadership style	
Telling only	1 (2%)
Selling only	25 (57%)
Participating only	13 (30%)
Delegating only	0 (0%)
Selling and participating	3 (7%)
Participating and delegating	2 (5%)

SD: standard deviation

* Average of team member ratings of the leader

† Self-ratings

Table 1 summarises the teammate-rated professionalism scores about their leaders, as well as the self-rated leadership scores and styles. Gender comparisons of all measurements showed no significant differences (data not shown). Two per cent of students identified themselves as “telling” only leaders; 57% of students were “selling” only leaders; 30% were “participating” only leaders. Only 7% and 4% of students identified themselves as dual “selling” and “participating” as well as “participating” and “delegating” leaders, respectively.

The mean leadership SAS for the entire class was 22.6, with a standard deviation of 4.3. Ninety-five per cent of students were either in the low or moderate categories of leadership adaptability. This indicates a need for improvement in leadership behaviour. The average professionalism ratings were between 7.3 and 8.1, which are on the high end of the scale.

Relationships with Exam Scores

Table 2 shows significant relationships with average team exam scores. Integrity (*P* <0.003), responsibility (*P* <0.001), and commitment to excellence (*P* = 0.022) of

Table 2. Univariate Models for Average Team Exam Scores (Significant/Borderline Significant Variables Only)

Response and predictors	Slope	P value
Written exam score (team average)		
Integrity	1.5	0.003
Responsibility	1.0	<0.001
Commitment to excellence	1.1	0.022
Male (vs female) leader	-1.4	0.007
Leadership style (estimated mean score)		<0.001*
Telling/selling only (83.5)	–	–
Participating only (86.5)	3.1	<0.001
Selling/participating (87.5)	4.0	<0.001
Participating/delegating (89.4)	5.9	<0.001
Practical exam score (team average)		
Respect	1.7	0.018
Integrity	2.0	0.002
Responsibility	1.2	0.037
Overall professionalism	1.8	0.013
Leadership style (estimated mean score)		0.010*
Telling/selling only (84.6)	–	–
Participating only (86.9)	2.3	-0.102
Selling/participating (81.5)	-3.1	0.004
Participating/delegating (88.6)	4.0	0.009

* Overall test for leadership style

Note: Dashes (–) indicate reference category of leadership style (telling/selling only)

group leaders were positively associated with higher written team exam scores. Teams with male leaders scored an average of 1.4 points lower than those with female leaders ($P = 0.007$). All leadership styles were significantly higher than the baseline category of “telling” only or “selling” only ($P < 0.001$).

Respect ($P = 0.018$), integrity ($P = 0.002$), responsibility ($P = 0.037$), and overall professionalism ($P = 0.013$) of group leaders were positively associated with higher practical team exam scores. Groups with “selling” and “participating” leaders scored an average of 3.1 points lower than groups with “telling” only and “selling” only leaders ($P = 0.004$), while those with combined characteristics of “participating” and “delegating” leaders scored 4.0 points higher on practical exams than those with “telling” only and “selling” only leaders ($P = 0.009$).

Discussion

In this study, most student leaders demonstrated either a “selling” only or “participating” only leadership style. Very few student leaders demonstrated a “telling” only or “delegating” only primary leadership style. Most leaders fell into the low or moderate levels of leadership adaptability.

The average class SAS for leaders in this study was 22.6; this falls into the lowest level of leadership adaptability and is associated with a “need for self development to improve both the ability to diagnose task readiness and to use appropriate leader behaviors”.¹⁴ Groups whose leaders demonstrated a “telling” only or “selling” only leadership style scored significantly lower on the written exam than all other leadership categories. For the practical exam, however, groups whose leaders were both “participating” and “delegating” scored significantly higher – while those whose leaders were “participating” and “selling” scored significantly lower – than the “selling” only and “telling” only groups.

Of the various attributes of professionalism, both integrity and responsibility were associated with higher scores on both written and practical examinations. Commitment to excellence was associated with higher scores on the written examination only, and respect and overall professionalism were associated with higher scores on the practical examination only. Likewise, respect, integrity, and responsibility were associated with improved overall group examination performance.

The 2 leadership styles employed by most students, the “selling” only and “participating” only styles, both involve high levels of relationship behaviour. Relationship behaviour involves communication with team members, whether that be listening, facilitating, or supporting the behaviours or actions of team members. The “selling” leadership style is also associated with a high-task behaviour, which involves the leader guiding the group and telling them exactly what to do. The “participating” leadership style, on the other hand, is associated with low-task behaviour.⁶ Thus, while most first-year Gross Anatomy students seem to employ good communication as a leadership tool, this study suggests that there is great variability in the amount of direction or guidance that student leaders provide for their groups.

There is no one style of leadership that is the optimal style in every situation. The readiness level of team members or of the team as a whole determines the optimal leadership style. Readiness is defined as “how ready a person is to perform a particular task”.⁶ Its 2 major components are ability and willingness. If students are both unable and unwilling to perform a task, then they are best served by the “telling” leadership style since the leader will closely guide them in performing the task.⁶ However, if students are both able and willing to perform a task, then they are best served by the “delegating” leadership style since a “delegating” leader will not dictate team members’ actions or be excessively encouraging; instead the leader will give team members the autonomy that they require.⁶

Since the “telling” and “selling” leadership styles were

associated with lower scores on the written exams, perhaps this signifies that a high level of instruction or guidance from peer leaders is not advantageous to first-year Gross Anatomy students. This makes sense since the peer leader has no more experience with the material than the members of his or her team. Thus, the leader who provides specific instructions is less useful to the group in preparing for written exams than the leader who encourages communication among team members.

Although it may seem odd that the groups with dual characteristics of “participating” and “selling” leaders had significantly lower scores on the practical exams than other groups, perhaps it simply means that the increased amount of encouragement or support by these leaders does not have much influence on students’ preparation for practical examinations. The “participating” and “delegating” leaders – those whose groups had higher practical examination scores – have in common the fact that they generally have a low amount of task behaviour. This may suggest that students are better able to prepare for practical examinations when they are given more autonomy during dissection and less guidance.

Some schools are incorporating professionalism training in the medical curriculum; perhaps this study provides guidance as to which aspects of professionalism are important early in medical education. Since integrity and responsibility were associated with both written and practical examination performance, it may be beneficial to concentrate on these professionalism characteristics early in medical education.

Several limitations of this study should be noted. Firstly, this study had a small sample size. Secondly, any one person acted as the leader of the group for a short time. Thirdly, this study was conducted on students at only one institution.

Conclusions

This study has demonstrated that various situational leadership styles and certain aspects of professionalism are positively associated with team performance in the Gross and Developmental Anatomy course which was offered early in the medical curriculum. This provides a foundation for the need to introduce professionalism and leadership curriculum early in medical education. Furthermore, the relatively low mean style adaptability score of the first-year Gross Anatomy group leaders in this study demonstrates that most first-year medical students are in need of further development of their leadership skills in order to be effective leaders who can recognise the needs of their group and

adapt accordingly. This skill is necessary in modern healthcare systems in which team-based practice is the norm. The first-year Gross and Developmental Anatomy course not only takes place very early in students’ medical education, but also involves a team-based approach to learning; thus, it is an ideal setting for the introduction of professionalism and leadership skills.

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Appendix 1

Date _____

Professional Associate Ratings (PARs) Form

Please rate the student/leader below in comparison to other students/leaders with whom you have worked. Circle one response per item. Circle the appropriate number between 1 and 9 where 1 is the lowest rating and 9 is the highest rating. If you had insufficient contact to evaluate this student/leader on a particular characteristic, circle UA (unable to evaluate).

Name of Leader (i.e. person being assessed) _____

Please check one of the following: I am the leader being assessed (i.e. I am assessing myself)
 I am a team member of the leader being assessed

Respect	1	2	3	4	5	6	7	8	9	UA
Shows inadequate personal commitment to honoring the choices and rights of other persons.					Always shows exceptional personal commitment to honoring the choices and rights of other persons.					
Integrity	1	2	3	4	5	6	7	8	9	UA
Shows inadequate commitment to honesty and trustworthiness in evaluating and demonstrating own skills and abilities.					Always shows exceptional commitment to honesty and trustworthiness in evaluating and demonstrating own skills and abilities.					
Responsibility	1	2	3	4	5	6	7	8	9	UA
Does not accept responsibility for own actions and decisions; blames other professionals.					Fully accepts responsibility for own actions and decisions; does not blame other professionals.					
Compassion	1	2	3	4	5	6	7	8	9	UA
Shows inadequate appreciation of other person's special needs for comfort and help, or develops inappropriate emotional involvement.					Always appreciates other person's special needs for comfort and help, but avoids inappropriate emotional involvement.					
Problem-Solving	1	2	3	4	5	6	7	8	9	UA
Fails to critically assess information, risks, and benefits; does not identify major issues or make timely decisions.					Critically assesses information, risks, and benefits; identifies major issues and makes timely decisions.					
Commitment to Excellence	1	2	3	4	5	6	7	8	9	UA
Shows inadequate commitment to the pursuit of excellence and continuous quality improvement.					Always demonstrates a commitment to the pursuit of excellence and continuous quality improvement.					
Overall Professionalism	1	2	3	4	5	6	7	8	9	UA
Shows inadequate commitment to the characteristics and attributes that constitute professionalism.					Always demonstrates a commitment to the characteristics and attributes that constitute professionalism.					